NOLOGY DEPARTMENT

THE PAPER INDUSTRY and PAPER WORLD

N EDUCATIONAL NEWS MAGAZINE—FEBRUARY, 1948

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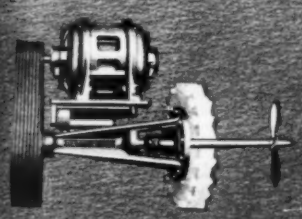

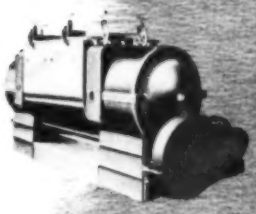

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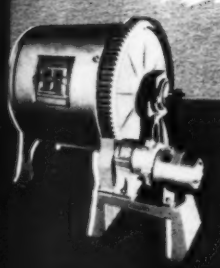
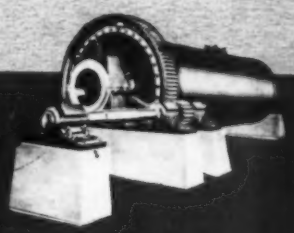
WITH *BETTER & FASTER* PRODUCTION!

SATISFACTORY PATTERSON MACHINERY

Patterson Satisfactory Machinery has an essential part in Industry's expansion this year . . . may we consult on your own equipment needs?

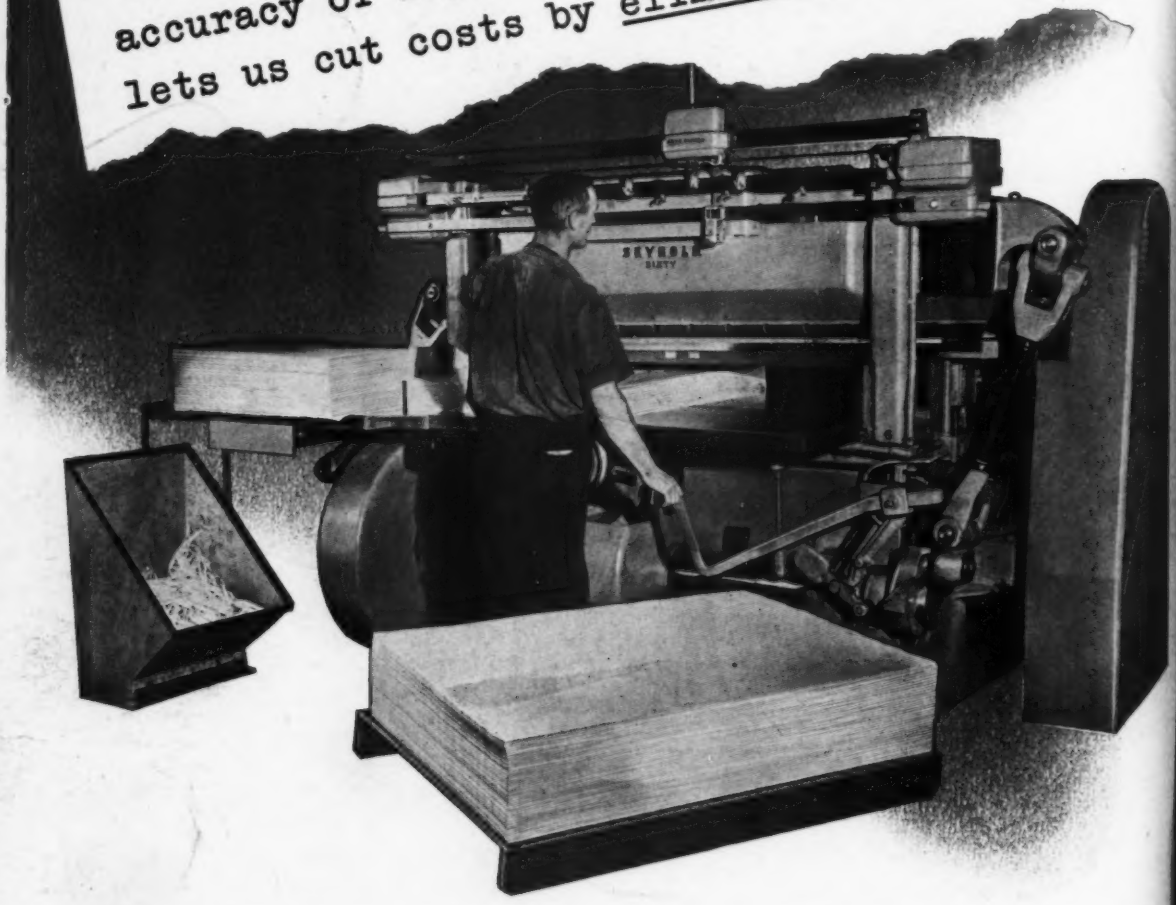
Richard L. Cameron
President

The Patterson Foundry and Machine Co.
East Liverpool, Ohio, U. S. A.

The Patterson Foundry and Machine Company (Canada) Ltd.
Toronto, Canada

BADGER PAPER MILLS, INC. REPORTS: "The extreme accuracy of Seybold 'Sixty' Spacer Trimmers lets us cut costs by eliminating retrimming."



"A demonstration convinced us that the Seybold 'Sixty' Spacer-Trimmer should fit in perfectly with our plans to reduce production costs. Even so, after giving our first 'Sixty' a chance to prove itself in actual production, we weren't quite prepared for the good news our production records revealed.

"Since it has been installed, we have found that retrimming is no longer necessary. Careful inspection disclosed that when cutting 8½" x 11" sheets to size, all piles were very uniform in size and were squared up as well, or better, than was formerly accomplished by retrimming.

"Furthermore, the 'Sixty' does its work so efficiently and easily that it has made a big hit with our operators."

Very frequently, important cost savings are introduced into paper mill operations as a result of an analysis of paper cutting procedure by a Harris-Seybold representative. His recommendations are based upon many years of close association with, and a thorough study of, paper mill production. Why not put *your* problem up to him? Write.

Harris-Seybold Company • Cleveland 5, Ohio

YOU TOO CAN CUT CUTTING COSTS WIT

SEYBOLD "Sixty" MILL SPACER TRIMMERS

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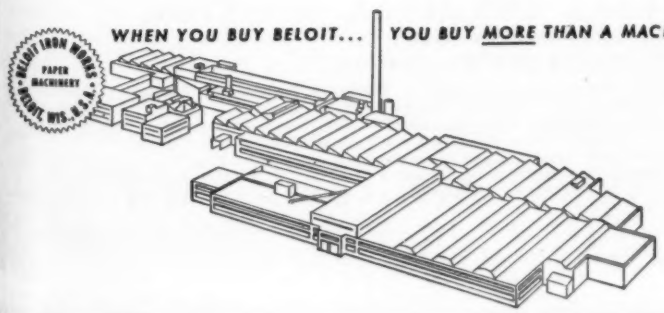
Ohio

Before it goes into a mill

The best place to eliminate "bugs" in new equipment is on the erection floor. Engineering changes at this point are costly, but save time and money later. Above, checking specifications of what we believe to be the largest winder (246″) ever built for use on coated paper: Beloit Sales Engineer Bill Goodwillie (left) and Lon Neese of the Beloit Engineering Department, *Beloit Iron Works, Beloit, Wisconsin.*



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This three-way personalized service by B&A can help make your laboratory procedure more efficient . . more productive. Arrange for it now by writing or phoning the nearest office below.

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* Complete stocks are carried here.

Don't Pass Dividends—Pass the Buck

IF YOU ARE A PAPER MAKER, and are plagued with poor production, pass the buck to Moore & White. Your equipment probably needs modernizing. We suggest that you *ought* to do it . . . and stiffening competition says that you *must*.

The ideal solution to the problem, of course, would be a new, up-to-the-minute Moore & White set-up, from Fourdrinier or vat section to lay boy.

If this is not feasible, the next best thing is to have us rebuild your present machines. We can unlimber those balky behemoths in your plant, take the creaks out of their joints, and streamline them for speed you never dreamed was in them. We will put them in such fine fettle that they'll deliver two- or three-fold their current output . . . enable you to wangle out the profits which may mean the difference between dividends passed or paid.

A major operation, yes. But it will take less time than to custom-design and build complete new assemblies . . . and the sharp-pencil boys in our engineering department will see to it that the cost is definitely less. They're itching to get going *now*.

The MOORE & WHITE Company

15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

Sutherland FIRST

About twelve years ago, the "then" astounding news leaked out that kraft paper was being made from stock prepared alone by Sutherland Continuous Beaters and Refiners. It had never been done before; some people didn't believe it, but it's been true ever since.

The original 14 Sutherlands in this mill are still in use, one more having been recently added. This mill produces well over 500 tons daily, their output ranging from 30 to 70 lb. bag, through 25 to 80 lb. wrapping, to 42 to 105 lb. liner board, and other specialty grades.

This is only one of many "Sutherland Firsts," and it produced a power saving of approximately 50% which, over a period of twelve years, has brought them a "substantial" return on their original investment, plus other advantages.

May we send you our new catalog, or may one of our engineers call?

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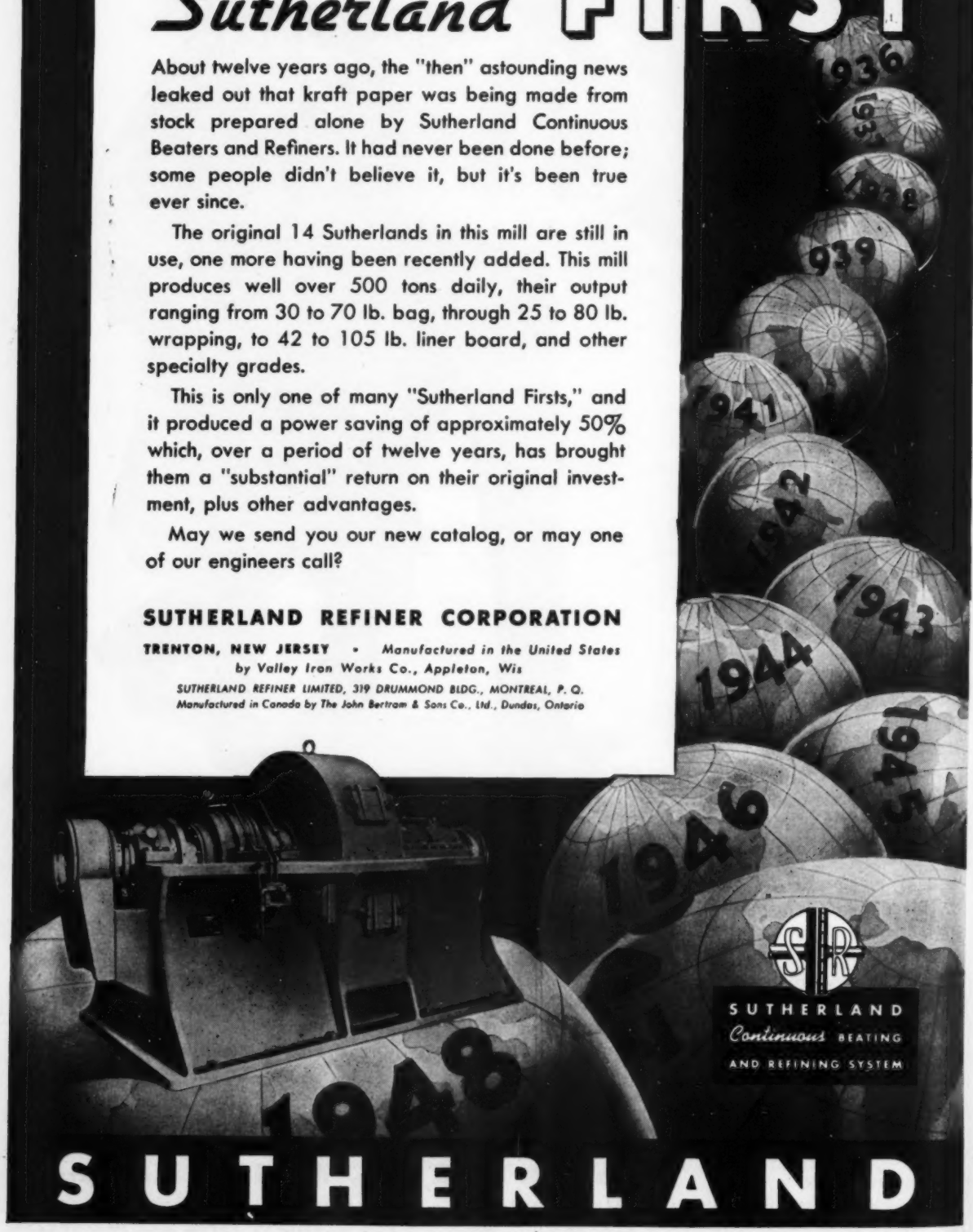
TRENTON, NEW JERSEY • *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis*

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL, P. Q. Manufactured in Canada by The John Bertram & Sons Co., Ltd., Dundas, Ontario



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THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 29 - - - - FEBRUARY, 1948 - - - - NUMBER 11

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Published monthly by FRITZ PUBLICATIONS, INC., 59 East Van Buren Street, Chicago 5, Illinois

EDWARD B. FRITZ, Founder
A. SCOTT DOWD, President and Gen. Mgr.
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Los Angeles • NOURSE ASSOCIATES • 412 West 6th Street • Vandike 5875 • Los Angeles 14, Calif.

THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in "The Industrial Arts Index." An index to each volume is issued annually by the publisher as Section Two of the April number.
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Member:
Audit Bureau of Circulation
Associated Business Papers, Inc.

Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year, $3.00 for two years. All other countries $3.00 for one year, $5.00 for two years.

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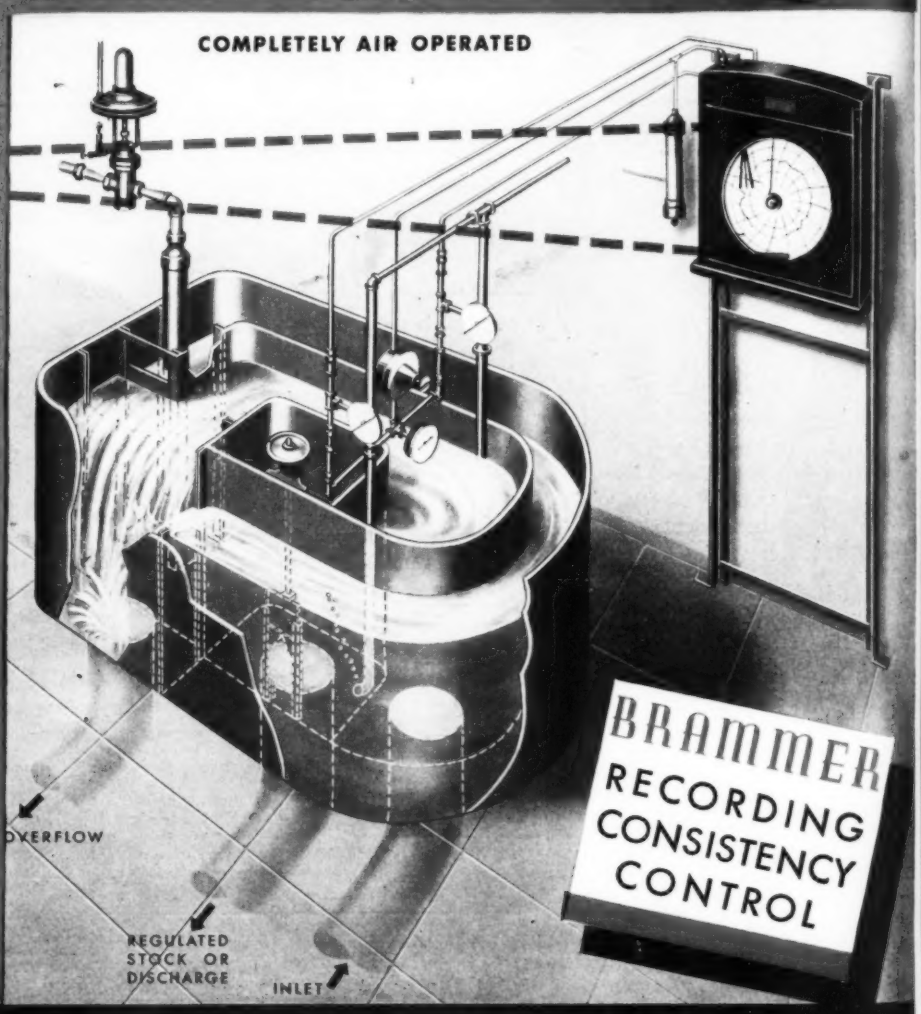

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122 EAST 42nd STREET NEW YORK, N. Y.

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NOW YOU CAN GET DIAPHRAGM VALVES WITH *Duriron and Durichlor* BODIES

Users of Durco equipment for handling corrosives and abrasives will welcome the news that the HILLS-McCANNA (Saunders Pat.) DIAPHRAGM valve is now available in Duriron and Durichlor.

DURIRON—A high silicon iron (14.5% Si) which has greater resistance to practically all corrosives than any other commercially available alloy. Specially resistant to alum, sulfuric and nitric in any concentration and at any temperature.

DURICHLOR—Similar to DURIRON but with superior resistance to hydrochloric acid and hypochlorite bleach.

Ask for bulletin 623.

THE DURIRON CO., INC.

DAYTON 1, OHIO

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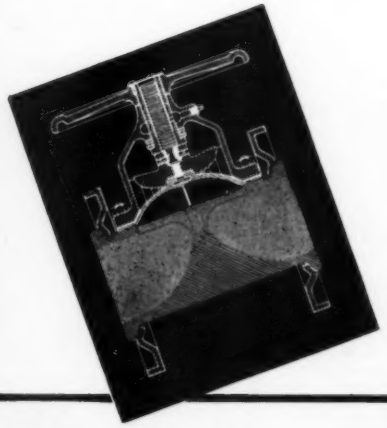
DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT



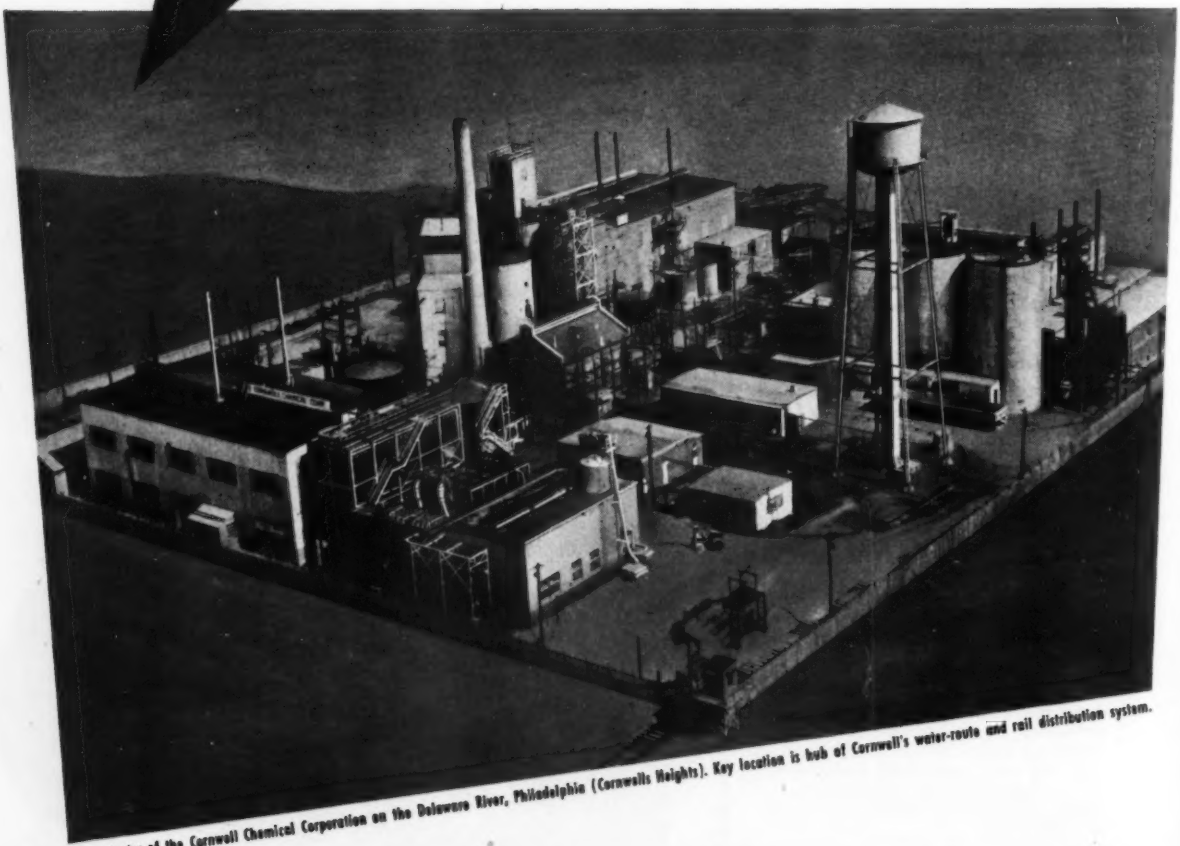
ADVANTAGES OF DURCO HILLS McCANNA (Saunders Pat.) VALVES

1. **THE CORROSION-RESISTANCE OF BODY IS UNIFORM.** No lining to become loose, crack, spall or absorb corrosives.
2. **DURIRON AND DURICHLOR ARE HIGHLY RESISTANT TO ABRASION AND CORROSION.** The unmachined, "as cast", interior surface increases this resistance.
3. **AMPLE WALL THICKNESS ASSURES LONG LIFE** even under the most severe corrosive and abrasive service.
4. **DIAPHRAGM EASILY REPLACED.** The Durco body can remain in the pipe line permanently. The principal part of the valve subject to wear is the tough, resilient, reinforced rubber or synthetic diaphragm. This part is inexpensive and can be replaced easily without removing the valve body from the pipe line.
5. **PRESSURE DROP IS LOW.** Flow can be in either direction.
6. **NO STUFFING BOX** to maintain. No lubricant can come in contact with the solution.

54-GM

SALT CAKE

.....paper makers' grade



Plant and Laboratories of the Cornwall Chemical Corporation on the Delaware River, Philadelphia (Cornwells Heights). Key location is hub of Cornwell's water-route and rail distribution system.

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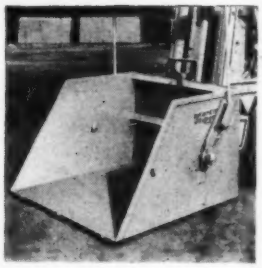
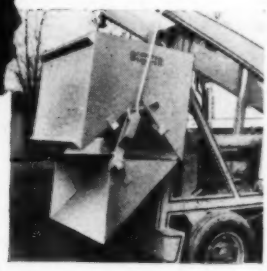
Mister-
-Youve been Waiting for the "DID"

DEMPSTER DUMPSTER



Above skip type body. Below drop bottom body. Note how bottom forms chute for material.



Remarkably versatile and mobile, the new Dempster-Dumpster "DID" provides an efficient and economical intra-plant materials handling system applicable to nearly every industrial operation. With one hoisting unit handling many bodies, this system is ideal for shifting material from point to point in plant and yard operations. On each trip, up to 2500 pounds of material can be picked up and carried inside the plant from yard stockpiles. Ashes or waste can be carried outside, dumped into a bin or truck body not exceeding 94 inches in height.

With the addition of an easily detachable boom extension, which can be elevated to a height of over 21 feet, the "DID" becomes a mobile crane capable of hundreds of tasks such as lifting pipe, scrap, light machinery, steel, etc.

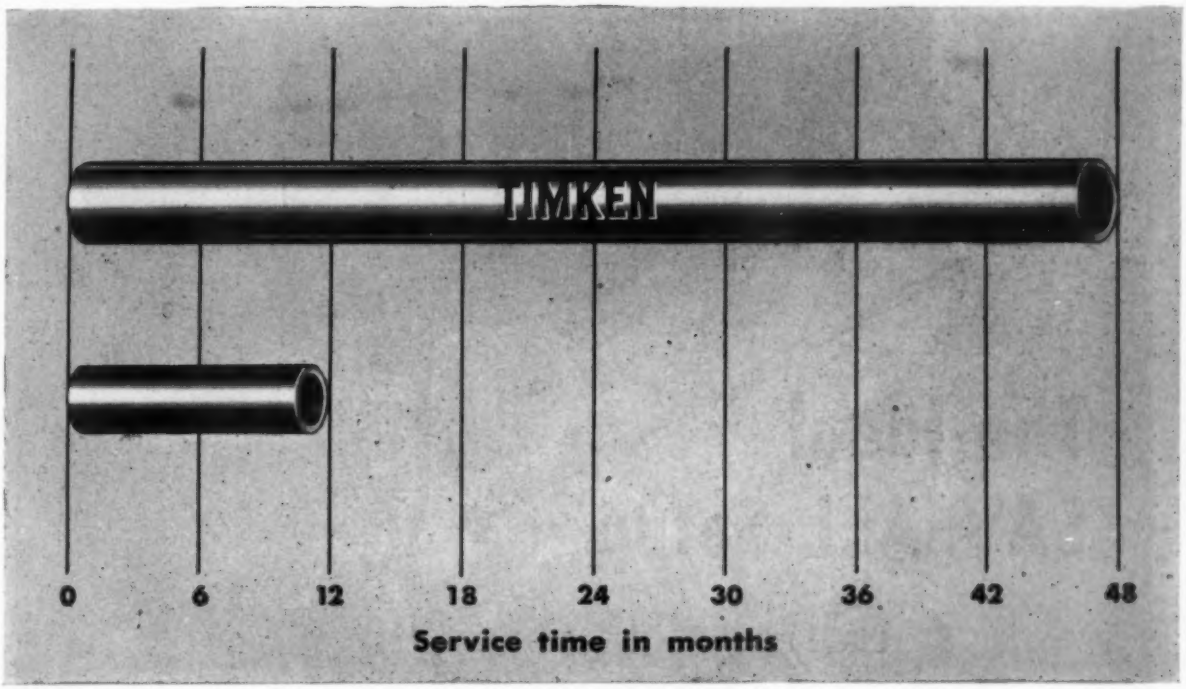
Shown above is the Dempster-Dumpster Type "DID" Tractor Hoisting Unit dumping a tilt-type body. At left top, the tilt-type body is in carrying position, and below Hoisting Unit approaches body to make the pick-up which is accomplished without the driver leaving his seat.

Detachable bodies are made in many designs to suit any need. Photos at right above show, for example, two other standard types. Write today for completely illustrated literature on this remarkable new Dempster development.

DEMPSTER BROTHERS, Inc.

928 Springdale, Knoxville 17, Tennessee

5% nickel can make a 300% difference in evaporator tube service



A RECENT survey on the effects of concentrated black liquor showed that Timken 5% nickel steel evaporator tubes averaged up to four times longer life than carbon steel tubes!

That 300% difference in service life of evaporator tubes means a substantial reduction in paper mill costs. Tube replacement costs are cut. Expensive downtime is reduced. Installation costs are lowered. And wear on tube sheets due to frequent installations is reduced.

Timken evaporator tubes of 5% nickel steel are the product of eight years' research by the Timken Company's metallurgists. They combine the ideal physical properties for maximum tube life per dollar invested. And you're sure of getting these same physical properties in each lot of Timken 5% nickel tubes you order. That's because every step of their production—from melt shop through final tube inspection—is completely controlled by the Timken Company. In addition, tubes must pass rigid inspection including hydrostatic testing before shipment.

Why not use our unequalled background of experience and research to help solve your tube problems? Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Ideal SAVEALL Setup

1. Oliver Filter
2. with Wood Drum
3. and choice of Rubber-Lined, Stainless Steel, Tile or Coated Vat

This recommendation is based on a study of several hundred Oliver Savealls over a period of nearly thirty years. Naturally, we recommend the Oliver as the recovery unit but having used all sorts of materials of construction we are convinced that for most installations nothing can equal the wood drum for economy and durability. This is proved by operating records. And to insure non-contamination of stock, we recommend the use of one of these materials for the vat: rubber lining, stainless steel, tile, or special coating.

The Oliver Saveall also offers the choice of three sheet dischargers—Oliver Denhard, Hydrair or Roll—thus adding to its effectiveness.

If you want to save fiber, filler and water for re-use with the unit already used by several hundred paper mills, you will want the Oliver.

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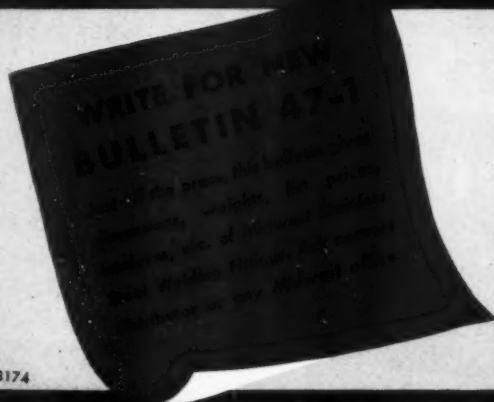
STAINLESS STEEL WELDING FITTINGS

BY MIDWEST



3174

Illustrated here are the various standard Stainless Steel Midwest Welding Fittings. Types 316 and 347 are carried in stock; type 304 and other analyses can be furnished on order. Fittings are hot formed, annealed and pickled; they conform with ASA Specifications for Steel Butt-Welding Fittings.

MIDWEST PIPING & SUPPLY CO., Inc.

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MIDWEST WELDING FITTINGS IMPROVE DESIGN AND REDUCE PIPING COSTS

SWEET MUSIC

Although Orr chemically-treated felts, known as Orr-Chems, have been available only a little over a year, already a large percentage of the mills have tried them and practically 25% have adopted them. From the standpoint of both manufacturer and mill, it certainly is "Sweet Music."

For a "maiden year" effort the above showing adds up to a record hard to beat and points the way for mills not yet Orr-Chem conscious.

Analyzing that record, the mills report the following benefits, not a single one of which should be passed over lightly.

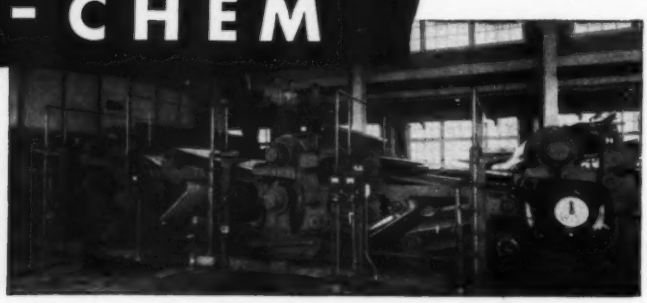
Orr-Chems set to the machine more quickly
Orr-Chems stay on longer
Orr-Chems drain water faster
Orr-Chems require fewer wash-ups
Orr-Chems are less inclined to shrink, or stretch, or blow.

These are not Orr claims. Rather, they are mill observations and they come from mills from coast to coast; from mills running practically every grade of paper and board made.

If you would cut the per-ton felt cost of your production and bring smiles to management, mill personnel, and stockholders, you should obtain some Orr-Chems for tryout.

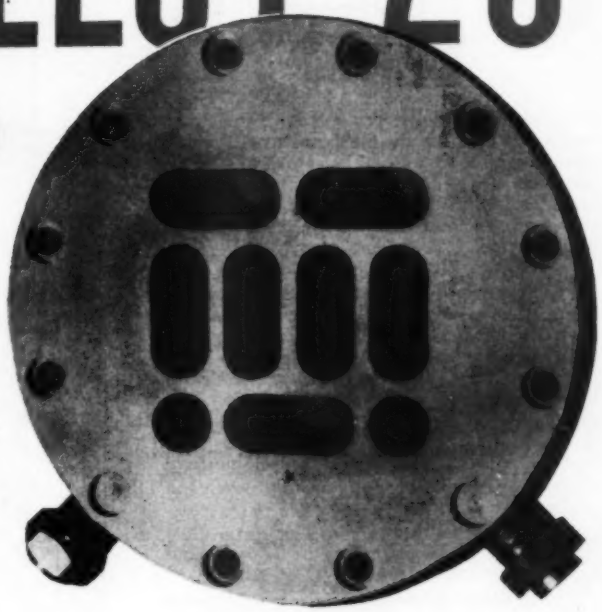
THE ORR FELT & BLANKET CO.
PIQUA, OHIO

ORR-CHEM



ESCO ALLOY·20

Conqueror of Corrosion



For some types of corrosives, the 18-8 grades of stainless steel are a "pushover." But the casting shown here is not an ordinary 18-8 alloy. It has far greater resistance to corrosion. *It is made of the new ESCO Alloy 20 stainless steel.* Like all castings made of *ESCO* Alloy 20, this casting offers

- Maximum resistance to corrosion
- Strength to withstand vibration and pressure
- Minimum loss of productive time
- Lowest possible maintenance expense

ESCO Alloy 20 is available for all regular and special fittings and corrosive-handling castings.

Let your nearest *ESCO* representative show you how *ESCO* engineering experience, gained through years of fighting corrosion, can increase your production and profits by putting Alloy 20 to work for you. Or write us, giving details of your corrosion problem. We will reply promptly, and without obligation to you.

ESCO STAINLESS STEEL FOR ULTIMATE ECONOMY

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STANDARD OF QUALITY

Pipe fabrication of every sort is Crane Co.'s business. From a simple bend to the most complex welded assembly, your design is assured of precise fabrication. Fully equipped, skillfully manned and strategically located, five Crane Pipe Shops are at your service.

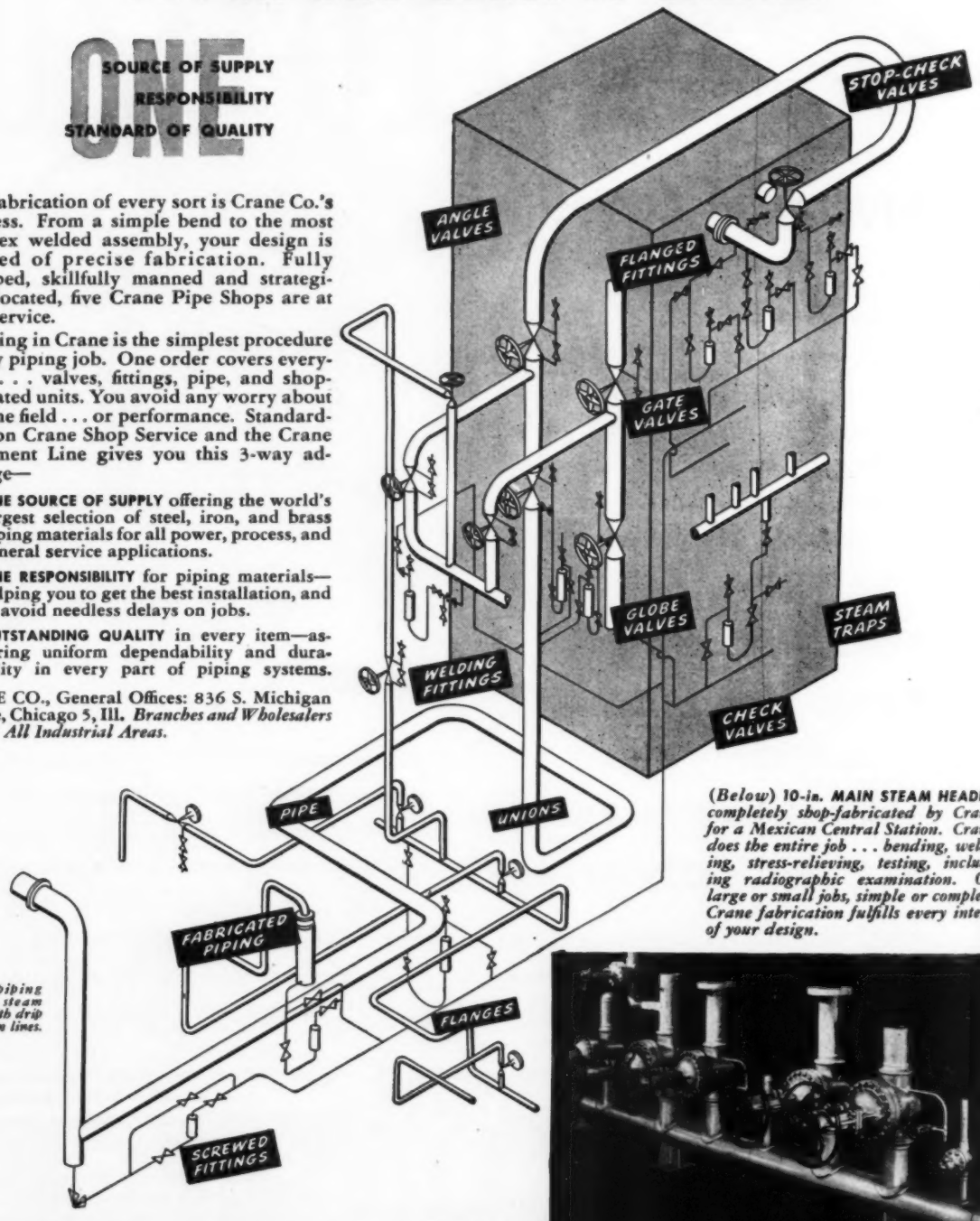
Calling in Crane is the simplest procedure on any piping job. One order covers everything . . . valves, fittings, pipe, and shop-fabricated units. You avoid any worry about fit in the field . . . or performance. Standardizing on Crane Shop Service and the Crane Equipment Line gives you this 3-way advantage—

ONE SOURCE OF SUPPLY offering the world's largest selection of steel, iron, and brass piping materials for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials—helping you to get the best installation, and to avoid needless delays on jobs.

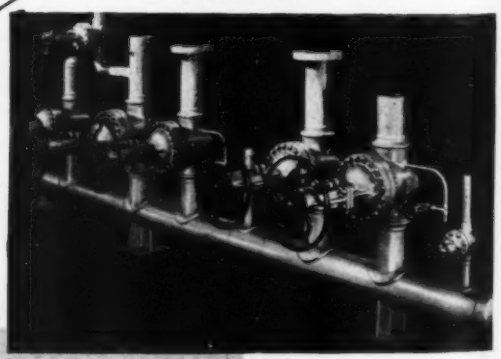
OUTSTANDING QUALITY in every item—assuring uniform dependability and durability in every part of piping systems.

CRANE CO., General Offices: 836 S. Michigan Avenue, Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas.*



Boiler piping showing steam mains with drip and drain lines.

(Below) **10-in. MAIN STEAM HEADER** *completely shop-fabricated by Crane for a Mexican Central Station. Crane does the entire job . . . bending, welding, stress-relieving, testing, including radiographic examination. On large or small jobs, simple or complex, Crane fabrication fulfills every intent of your design.*



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VALVES • FITTINGS
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THE AMERICAN

DIESELECTRIC

A REVOLUTIONARY NEW LOCOMOTIVE CRANE

Seven tons of wearing parts eliminated!

Pays for itself in FIVE YEARS . . . as proved by long-term cost records.

40-TON POWER makes light work of big loads

DIESEL power to the deck;

ELECTRIC power to the trucks

CLEAR-VIEW CAB lets operator see load at all times

DIESEL-ELECTRIC LOCOMOTIVE CRANE. PATENT NO. 2083460. TOUCH CONTROL. PATENT NO. 2370856.

Plant No. 2: So. Kearny, N. J.

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American Hoist and DERRICK COMPANY

Saint Paul 1, Minnesota

for Catalog 600-L-4, with full details about the DIESELECTRIC. See how this all-new crane design eliminates seven tons of wearing parts . . . slashes upkeep expense 25% to 50% . . . makes rail travel faster, smoother . . . brings pulpwood handling costs to sensational *new lows!*

*Name*_____

*Company*_____

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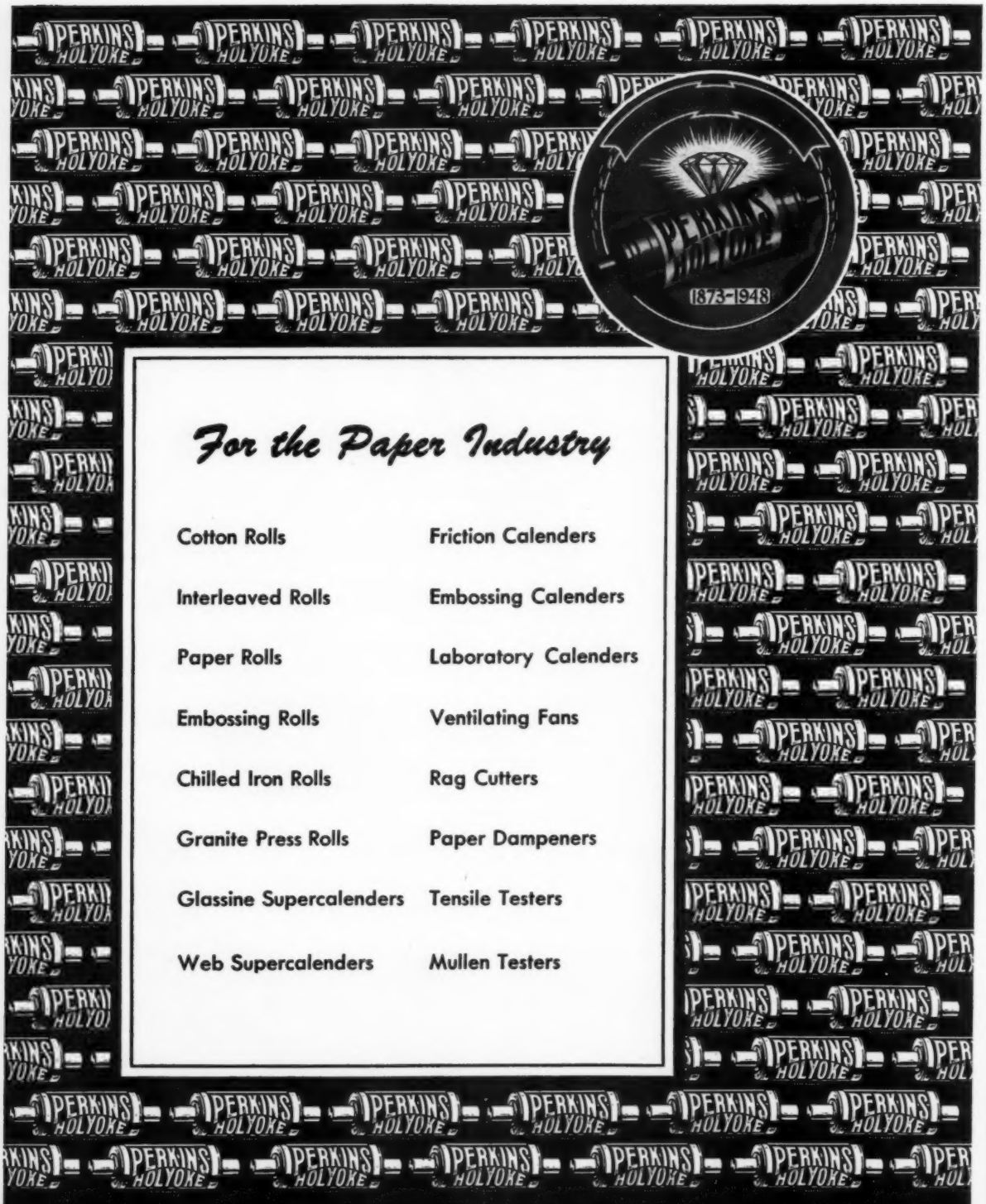

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LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

HERE'S A FORMULA every papermaker should know—*one that paper and board mills everywhere have used profitably for years!*

Hercules, as a major producer of gum and wood rosin, has access to the basic raw materials for the finest Prepared Sizes. Careful control over the production and processing of these raw materials assures the papermaker of consistently uniform sizes designed to meet his most exacting needs. Hercules' Product Service is the *plus* offered through Hercules' service representatives—men who *know* papermaking.

Together, Hercules Prepared Size and Product Service add up to Papermill Savings in time, trouble, money, and labor.

P.S.

Hercules Prepared Sizes include:

ROSIN SIZES
(*dry, paste, or emulsion; light or dark grades*)

ROSIN WAX SIZES
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WAX EMULSIONS
(*Paracol*®)

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We guarantee*

in writing that if at any time the neutralization number of NONPAREIL should rise higher than 0.15 mg. KOH/g., the oil will be replaced without charge. You will not have to rest, sweeten, or remove the oil for treating to maintain this low acidity. It will operate year after year

without forming deposits. Change oil for the last time. *CHANGE TO.....*

Standard Oil Company (Indiana)
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NONPAREIL
TURBINE OIL

*"We guarantee that Nonpareil Turbine Oil, Medium and Heavy, will last as long as your turbine where the lubrication system is thoroughly cleaned before this oil is put into use and where Nonpareil Turbine Oil, Medium or Heavy only, is used for replenishment, and where the temperature of the oil from the bearings is kept below 170°F. This guarantee has no time limit. If at any time, when the oil is operating under the above conditions, the neutralization number should rise higher than the extremely low limit of 0.15 when determined by A.S.T.M. Method D 188-27 T, we will cheerfully replace the oil without additional expense."

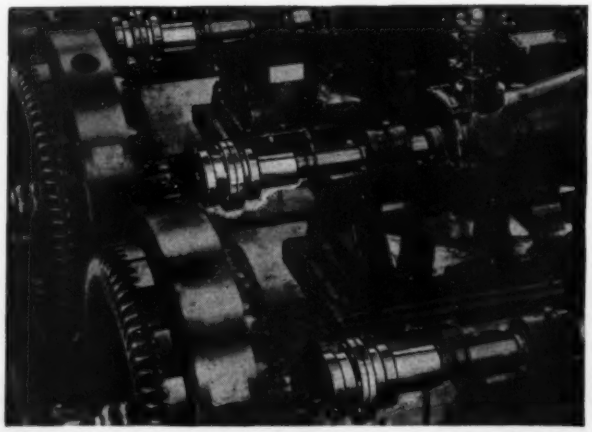
STANDARD OIL COMPANY (INDIANA)

STANDARD

How to Get

Uninterrupted Power Transmission for All Paper Mill Drives!

SPECIFYING Fast's self-aligning Couplings is the answer! No matter what your coupling problem, there's a Fast's made to solve it . . . and give you longer machine life, lower upkeep costs and minimum shut-down losses. For absolute dependability, these *original* gear-type couplings are built with many important features . . . such as an *exclusive* "rocking bearing." This bearing is *exclusive* in providing a positive metal-to-metal seal against wear-producing moisture, dust and grit. The bearing is also exclusive in its correctly engineered position which allows *freedom of movement* to compensate for misalignment because its *spherical* base has *the same axis* as the hub spline faces. And as a plus, Fast's Couplings give you the benefits of years of top engineering experience, Koppers' high standard of workmanship and unexcelled coupling service which assures spare parts no matter how old your couplings may be. For full information, mail the coupon below to: Koppers Co., Inc., Fast's Coupling Dept., 232 Scott St., Baltimore 3, Md.



FOR JORDAN ADJUSTMENTS—Fast's Jordan-Type Couplings reduce wear on bearings, prolong life of motor and Jordan. Because the Fast's splines are meshed in oil, plug adjustment is smooth and certain. No worn spots can develop. The customary "hard spot" is eliminated. Due to smooth torque and elimination of coupling vibration, Jordan lining life is increased and the product discharged from the Jordan is uniform.

FOR STANDARD APPLICATIONS—Fast's Standard Couplings are designed for use on all ordinary installations. They are made in shaft sizes from 1½" to 5".

FOR REMOTE DRIVES—Fast's Floating Shaft Couplings enable drives to be set back from paper machines without the use of supporting bearings. This eliminates one piece of equipment—does away with the necessity of keeping three or more bearings in line—saves installation cost and eliminates upkeep, attention and replacement of bearings.

K KOPPERS

FAST'S *self-aligning* COUPLINGS

SEND FOR FREE CATALOG!

Gentlemen: Please send me your illustrated, informative catalog, giving full information on the many types of Fast's Couplings.

Name.....

Company.....

Street.....

City.....Zone.....State.....

Unbleached Sulphate Pulp Mill

This new plant of Bloedel, Stewart & Welch, Ltd., at Port Alberni, on Vancouver Island, British Columbia, is the newest pulp mill to go into production in the Northwest.

1948

TRADE WINDS

◆

New Kraft Pulp Mill at Port Alberni Has Gone into Production

▶▶▶ THE NEW UNBLEACHED kraft pulp mill of Bloedel, Stewart & Welch Limited at Port Alberni, British Columbia, swung into full production on January 11 as power from the British Columbia Power Commission's new hydroelectric project at Campbell River reached the company's buses.

This plant was designed by Howard A. Simons to operate in connection with the company's sawmill and logging operations in Port Alberni. The mill has a rated capacity of 165 tons per day, and is modern in every respect; particular attention having been given to instrumentation and other features of design which will help to insure uniformity of quality of the product.

The operating personnel of the pulp division includes:

James Petrie—Manager
Einar Walloe—Superintendent
L. G. Harris—Asst. Superintendent
G. C. G. Jones—Plant Engineer
E. Strain—Technical Director

Bloedel, Stewart & Welch Limited was established in British Columbia in 1911 as a logging enterprise. Operatings gradually have been expended until, in addition to large logging camps, they include two sawmills on the west coast of Vancouver Island, a shingle mill at Port Alberni, and one at Vancouver. The latest project, of course, is the pulp mill just now going into production.

Officers of the company are:

J. H. Bloedel—Chairman of the Board
Prentice Bloedel—President and Treasurer
S. G. Smith—Vice President, Timber Division
B. M. Farris—Vice President, Lumber Division
R. S. Laird—Secretary and General Sales Manager

Left to right: L. G. Harris, assistant superintendent; J. Petrie, manager, Pulp Division; and E. Walloe, superintendent—Bloedel, Stewart & Welch Limited

◆

FINANCIAL

▶▶▶ THIRTEEN CONSECUTIVE days of falling securities markets in the latter part of January had a natural effect on paper mill issues. The uncertain world position and the future under the Marshall plan were generally responsible for the pessimism among speculators and investors alike.

Brown Company—Net income for the fiscal year ended November 30, 1947, was $2,800,000 as against $1,593,982 for the previous year.

Celotex Corporation—Net income for the fiscal year ended October 31, 1947, was $6,227,929 as against $3,824,324 in the previous year.

Paraffine Companies—Net earnings for six months ended December 31, 1947, were $1,883,033 as against $1,530,625 for the second half of 1946.

Paper Mill Corporate Changes

Brown Company—Directors are working on a new recapitalization plan to provide new securities in place

of the present preferred stock on which considerable unpaid dividends have accumulated. About $800,000 of the company's earnings in 1946 are not available to the company for use in the United States because of Canadian foreign exchange regulations.

New York Stock Exchange—Stocks

	Closing Prices Jan. 26, 1948	Dec. 31, 1947
A.P.W. Products	*4½-5	5
Celotex	24	27⅛
Same Preferred	20	*19¾-20
Certain-teed Products	15⅛	16½
Champion P & F Co.	19½	22
Same Preferred	*98-100	*99-102
Container Corp.	40¼	42¼
Same Preferred	95¼	93½-95½
Cont. Diamond	10⅞	11½
Crown Zellerbach	29⅝	33⅞
Same Preferred	94	*98½-99
Same $4 Preferred	111½	*126-128½
Dixie Vortex	37	*38-40
Same "A"	50	53
Robert Gair Co.	7¾	8⅞
Same Preferred	19	*19½-20
International Paper	47	54
Same Preferred	91	94½
Kimberly Clark	21	21⅝
Same Preferred	98½	*102½-104
McAndrews & Forbes	37	*38½-39
Marathon	22¾	22
Masonite	55	60
Mead Corp.	19	19⅞
Same Preferred	*91-93	*93-94
Same 2d Preferred	40	41½
National Container	12⅝	13⅝
Paraffine Cos.	76	74
Same Preferred	100	96¼
Rayonier, Inc.	23½	30¼
Same Preferred	32½	33⅞
Scott Paper	42	44¾
Same Preferred	94¼	*93-94
St. Regis	9½	10
Same Preferred	*80-81	82
Sutherland Paper	39	*43¼-43½
Union Bag & Paper	30¼	33¼
United Bd. & Cart.	13⅜	14½
U. S. Gypsum	95½	105
Same Preferred	169-170	171
U. S. Wall Paper	5⅛	5¾
Same Preferred	*30-31	*33½-36
West Va. P & P Co.	42	44½
Same Preferred	*100-102	*102-105

New York Stock Exchange—Bonds

Celotex 3½%	99½	....
Champion P & F Co.	....	98¾

New York Curb Exchange—Stocks

Am. Writing	8¼	9
Great Northern	42	47
Taggart	10½	10½

*Closing Bid and Asked Prices.

◆

BAG PRODUCTION IN MOBILE BEGUN BY ARKELL & SMITHS

Arkell and Smiths (Canajoharie, N. Y.) has begun the production of multiwalled paper bags in a new plant at Mobile, Alabama. The plant was designated and built by The Rust Engineering Company for complete mechanical handling of material and product. It supplements bag production of factories at Wellsburg, West Virginia, and Canajoharie.

Within the plant paper rolls are handled by overhead monorail cranes. Rolls are printed on a Schmutz Web printing press and then enter two production lines where tubing and cutting is registered with the printing by means of an electric eye mechanism. The tubes are moved on conveyors to valvers, then to sewing machines and to Coty bottomers. Finished bags are baled mechanically and handled by powered lift trucks.

Washington

RECIPROCAL TRADE NEWS REPORTED BY IMPORT COMM.

Five of the Geneva reciprocal Trade Agreements became effective January 1, having been mutually agreed upon by the United States and the negotiating countries. All of the United States concessions on paper became effective on that date and concessions, if any, granted by other countries now effective are summarized by the Import Committee of the American Paper Industry as follows:

Canada — Previously reported in detail.

United Kingdom—No changes in any paper or paperboard rates.

Benelux—(Belgium, Luxembourg, Netherlands). No changes in paper rates.

Australia—"Primage" of 10 per cent waived on newsprint, tissue, coated printing, uncoated printing, writing, glazed imitation parchment, typewriting, not including duplicating paper, wrapping, greaseproof wrapping, imitation greaseproof wrapping, fruit wrapping, cigarette tubes and papers for each 60 cigarettes.

France—An entire change in tariff procedure has been effected with the setting up of a flat ad valorem system of assessing duties instead of the former system and compound rate system. The net result is that the new schedule of duties in estimated to have granted the United States "concessions" which are in net result higher than the old rates, but lower than those established as a tariff basis. A complete schedule of tariff rates has been fixed in which the following are the principal items listed; greaseproof, brown groundwood paper and paperboard, all chemical pulp papers, lined paper and paperboard (without straw or kraft) cellulose wadding, coated paper (other than Baryta coated), paper without mechanical pulp. Made on a winding machine (presumably including kraft), 25 per cent. The only apparent provision for writing paper is a 20 per cent rate for paper containing 75 per cent or more rag pulp. Straw papers are dutiable at 18 per cent. Most other grades are dutiable at from 18 to 25 per cent.

Taking advantage of the "escape clauses" in its Reciprocal Trade Agreement negotiated with the United States in 1943, Mexico has cancelled 132 tariff concessions made to the United States in that Agreement. The old basis of assessment of duties has been changed from the specific rate based on pesos per kilogram to a compound rate of both specific and ad valorem rates.

The result is the increase in the duty rate on paper to a figure above that in effect in 1942. The changes are as follows:

Paper of the natural color of the pulp, weighing more than 50 but not more than 100 grams per square meter, from .14 peso per legal kilogram to .10 peso plus 20 per cent ad valorem.

Similar paper weighing more than 100 grams, from .10 peso to .07 peso and 15 per cent.

Paper of any kind, not specified, weighing up to 100 grams, cut in strips up to 10 centimeters in width, from .80 peso to .55 peso and 10 per cent.

Paper weighing over 100 grams and cut into strips up to 10 centimeters, from .60 peso to .20 peso and 10 per cent.

Paper, cut for the dressing table and the toilet, from .26 peso to .15 peso and 15 per cent.

Other developments reported by Warren B. Bullock, manager of the Import Committee are as follows:

A San Francisco importer of duplex kraft has abandoned his claim of the sheathing paper rate of 10 per cent on merchandise classified for duty at 20 per cent as kraft paper.

Importers have abandoned fifty-seven cases involving the dutiability of bibulous and similar papers imported in sheets and rolls. The paper was classified for duty as tissue paper at 6 cents per pound and 20 per cent, but had been claimed dutiable at 5 cents per pound and 15 per cent as filtering paper.

Importers have also abandoned seventy-seven cases involving tissue paper coffee filters in disc form. The paper was assessed for duty at 6 cents per pound and 20 per cent, 5 cents per pound as tissue paper, but had been claimed dutiable as filtering paper at 5 cents per pound and 15 per cent.

ACTIVITIES AND FINDINGS OF SMALL BUSINESS COMM.

Senator Capehart whose Small Business Committee investigated the newsprint situation last year has filed a written inquiry with the State Department to learn whether, in the present famine condition of American newspapers, the Marshall plan contemplates the allocation of United States newsprint to Europe. Unofficial Administration statements have previously been to the effect that no pulp or paper will be exported under the plan for assisting the economic recovery of Europe. Senator Capehart, however, says he has heard that

PAPER · · · America's 6th Industry

CENTENNIAL SPOTLIGHT 1848-1948
In this 100th anniversary year as Machine Builders for the Paper Industry, Puseyjones points with pride to outstanding post-war installations. In the spotlight . . . 236" Kraft Machine built for: Union Bag & Paper Corporation, Savannah, Georgia.

STEAM PRESSING WITH PAPER

(NEWS ITEM: *A new parchment paper is replacing cloth for home steam pressing jobs.*)

Professional tailors can take a lesson in steam pressing from today's homemakers. The new housewife tears off the required length of a new type of parchment paper, moistens and goes to work. When wet, this new paper becomes transparent, making it easy to turn out a professional-looking pressing job. Pressing paper has pressing qualities of cloth and is nearly as durable. Cheaper than cloth, it can be discarded after being used. We will supply manufacturer's name on request.

Paper soap tissues . . . paper draperies . . . paper washcloths . . . paper for dusting . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities —new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines. Additional capacity in Metals Fabrication is now available through conversion of facilities formerly devoted to the building of ships.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

large allocations of newsprint are being considered.

A subcommittee of the United States small business committee has filed a report suggesting that newspaper publishers form a co-operative to finance Alaskan newsprint mills. The report also recommended that the Federal Power Commission make a complete study of potential power resources at Alaska pulp mill sites, that the Forest Service and Labor Department consider developing plans to recruit pulp workers for Alaska, and that the Forest Service be given authority to require the production of a specific product, such as newsprint, from national forest timber.

Senator Pepper has introduced a bill to extend for two years from July 1, 1948, the amendment to the Tariff Act allowing newsprint in rolls from 15 to 9 inches in width to come into this country duty free.

CRITICS COMMENT ON THE APPOINTMENT OF McCABE

No little excitement has been stirred up in Congressional circles by the action of President Truman in naming Thomas B. McCabe, president of Scott Paper Company to the chairmanship of the Federal Reserve Board. Mr. McCabe has held other government appointments as a business executive whose ability was called upon by the Nation in time of need. This appointment, however, is causing caustic comment among even Republican leaders who question the reasons for the appointment even though Mr. McCabe is a well-known Republican.

The critics seek to know what political motives caused the demotion of the former Chairman, Marriner S. Eckles. The criticism of the appointment of Mr. McCabe must be understood to be due to no opposition to him, but to the President's motives in making a change in the Nation's central banking and financial agency.

◆

ASPEN NOW LEADING PULP SPECIES IN LAKE STATES

The importance of aspen to the Lake States pulpwood industry is brought out by a survey recently made by the U. S. Forest Service. In 1946, aspen accounted for about one-third of the total regional pulpwood production of 2¼ million cords, and for the first time on record became the principal pulpwood species of the region. Ten years earlier, only about 90 thousand cords of aspen pulpwood were produced in the Lake States.

About three-fourths of the 2.9 million cords of pulpwood received by Lake States mills during 1946 was produced within the region. Of the total regional production, Minnesota supplied about 43 per cent, Michigan about 38 per cent, and Wisconsin about 19 per cent. Pulpwood produced in the Lake States and shipped out of the region amounted to only a little over 50 thousand cords—7 per cent of the quantity imported.

◆

WORTHY CAUSES RECEIVE NEPCO FOUNDATION GIFTS

John E. Alexander, president of the recently established Nepco Foundation, has announced foundation gifts totaling $11,000 to six churches in

John E. Alexander

and near Port Edwards and Nekoosa, Wisconsin; Riverview hospital in Wisconsin Rapids; the Nepco Lake Boys' and Girls' lodge; and the University of Wisconsin Y.M.C.A. at Madison.

Nepco Foundation became an operating entity as a charitable corporation on December 5, 1947, when the foundation was presented with gifts valued at $144,000 from Nekoosa-Edwards Paper Company. (Cf. P. I. and P.W., December, 1947, p. 1410.)

◆

BRITISH PAPER NOTES (December, 1947)

Having reached the last month of the year, we are able to review the trend of the British Paper Trade during the past twelvemonth. Unhappily it has been a backward trend due not only to the national and international situation but in part to the elements; for whereas a terrible winter, among other things, led to the coal crisis, an equally beautiful summer resulted in a prolonged drought which not only affected many mills in this country but also the greater part of Europe and more especially the Scandinavian countries where the absence of adequate water and electrical power had serious consequences on the pulp producing industry. Concurrent with the above has been a late and more serious attempt to boost up exports which has tended to rob production from home consumption to the benefits of exports but which, in the case of the Paper Trade at least, has not yet begun to operate.

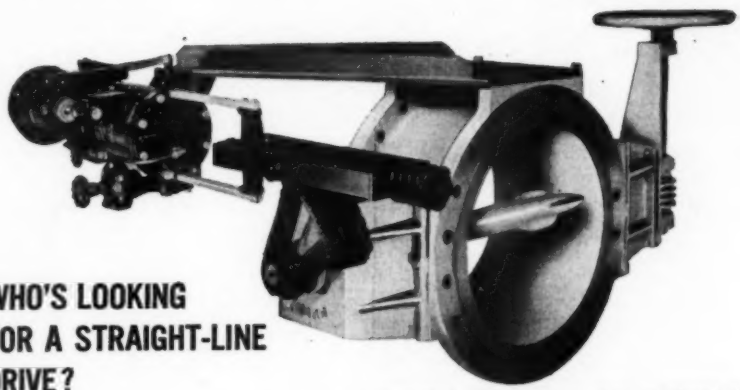
As far as the British Paper Trade is concerned, the progress which has been made is remarkable particularly in view of the fact that the imports of wood pulp have been steadily declining over the latter months of the year. The November Board of Trade Returns (the latest available at the time of writing these notes) reveal that comparing the periods January-November 1938, 1946 and 1947 the imports of chemical, dry, bleached pulp have declined from 171,440 tons in 1938 to 123,223 tons in 1946 and 106,411 tons in 1947. Similarly the respective figures for chemical, dry, unbleached are 529,369, 312,438 and 278,045 tons. The chemical, wet which in 1938 totalled 174,909 tons reached 59,505 tons in 1946 but improved slightly in 1947 with 78,716 tons. Mechanical pulp, wet although 9,000 tons up in 1947 against the previous year at 238,801 tons is little more than a third of the prewar imports. In all wood pulp, imports have dropped from the round figure of 1,483,000 tons in 1938 to 712,700 tons this year and the latter total is approximately 25,000 tons down on 1946. During the same period the imports of esparto grass which at one time practically reached prewar levels have now declined to 84 per cent of 1938.

On the paper consumption side it has been disclosed by a recent parliamentary reply that during the present license period His Majesty's Stationery Office and other Government Departments will be taking 158 per cent of their prewar rate. With total production almost halved this is a serious development and is understandable that such low figures are given for newspapers (31 per cent), periodicals (32 per cent), industrial uses (62 per cent) and export (46 per cent). Yet against these is 91 per cent for book publishing which appears on the face of it an unequable distribution.

In respect to newspapers it has been feared for some weeks that these would have to be reduced to two pages but it would appear from the latest information that the four page paper will be maintained with the hope that inroads into present stocks will be re-

R-S valvEvents

ISSUED PERIODICALLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH FLOW CONTROL AND SHUT-OFF



WHO'S LOOKING FOR A STRAIGHT-LINE DRIVE?

Constant 90° angularity between the prime mover and the valve stem . . .

Since 1943 the R-S Type 602 valve has had great success in the service of our customers who want Straight-line drive.

The picture shows a 24-inch 150-pound R-S Cast Steel valve with Series 15 raised face flanges and air-cylinder positioner. Hydraulic cylinders and air diaphragm motors, with or without positioners, are also available. They operate through a chain and sprocket providing straight-line action and eliminating compensation for angularity of bell-crank arm.

The valve pictured is provided with dual stuffing-boxes which cause the vane to "float" regardless of working pressure in the line. The handwheel and de-clutching unit for manual control are mounted opposite to the mechanical control side of the valve.

These R-S valves are available in all sizes for many temperature and pressure ranges.

R-S Appoints New Representatives

Latest appointments to the growing list of R-S Valve Representatives are:

Los Angeles: W. J. Beckett, 108 West Sixth Street, Los Angeles 14, handling Southern California. Phone Vandyke 2914.

San Francisco: Merrill Company, 502 Market Street, San Francisco, handling Northern California. Wm. H. Edis is in charge of the Merrill organization. Phone Sutter 1-8280.

Knoxville: L. W. Oakley Sales Engineers, 408 West Church Avenue, Knoxville 10, Tennessee. The Oakley organization covers Tennessee, with offices also in Chattanooga and Johnson City.

Birmingham: Harry G. Mouat, 544 American Life Building, Birmingham 3, Alabama; covering Alabama and West Florida.

Santiago: Garrido, Garcia Burr & Co., Calle Central 40, Santiago, Chile.

R-S ESTABLISHES NEW ELECTRONIC DIVISION

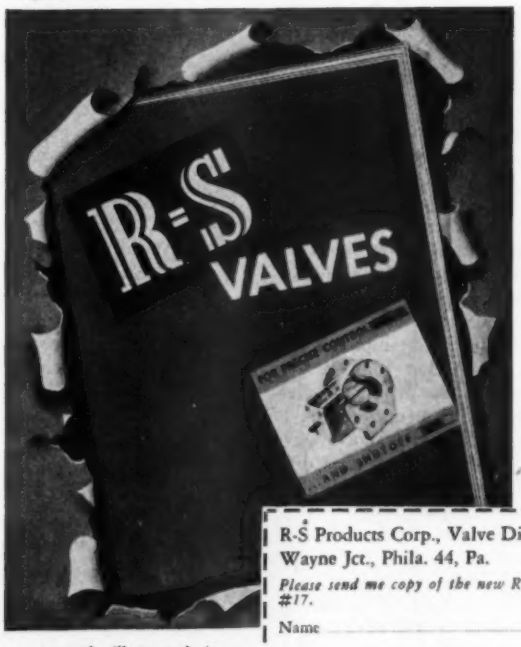
To thoroughly inform its Valve Division representatives, who will handle the line, on the products and developments of its newly established Electronic Division, R-S Products Corporation recently called two special conferences. A Western group met at Chicago and the Eastern group at the company's plant in Philadelphia.

The Electronic Division is under the direction of David W. Hopkins, Executive Vice President of the company, and under the immediate management of Donald C. Culver, Ch.E. Culver, a graduate of Lehigh University, is an experienced physicist in the instrument and electronic field.

A new product of the Electronic Division is a unit for the control of fluid level, pressure and temperature, (R-S Catalog No. 27) called the Leveltronic, or Level Control.

JMLco P-AA2

Send for YOUR copy of the NEW R-S Valve Catalog No. 17!



Fully descriptive, generously illustrated; includes *complete* dimensional data on *all* R-S Valves. Write, wire, or phone: R-S PRODUCTS CORPORATION, Wayne Jct., Phila. 44, Pa.

R-S Products Corp., Valve Division
Wayne Jct., Phila. 44, Pa.

Please send me copy of the new R-S Valve Catalog #17.

Name .....

Title ..... Company .....

Street ..... Zone .....

City ..... State .....

New folding carton plant of Container Corporation of America, at Greensboro, N. C.

cuperated during the second half of 1948.

Meanwhile although exports for the present period, as noted above, are set at 46 per cent of prewar the total exports for 1947 down to November show that the Trade has been able to reach 64 per cent but for the first time during recent months November disclosed a decline in exports against the previous month. It is believed in some quarters that the struggle to maintain this percentage will become increasingly difficult. The trend in other countries also towards increased exports is stressed by the recent report from Sweden where as large a paper export as possible is to be maintained despite reduced pulp production. To this end a cut in newsprint supplies to newspapers and periodicals, some as low as 50 per cent of 1946 consumption is to be made.

On the brighter side the Trade Agreement between Sweden and Great Britain has now been signed. Among other items Britain is to ship 500,000 tons of coal to Sweden which should prove of inestimable benefit to Sweden. Other items are also to be exported and in return Britain will receive from Sweden certain imports which will include mechanical and chemical pulp. A leading member of the British coal industry has predicted shipments of from 10 to 15 million tons of coal next year from Great Britain to overseas countries with the possibility of returning to prewar coal exports within two years. But with recent difficulties so fresh in mind optimistic forecasts are not popular.

The British Paper Trade, however, faces the coming year with one certain advantage over the beginning of 1947, there is no coal crisis looming ahead. Manpower is still difficult particularly in the Salle and despatch departments and will continue so until essential industries are completed and material supplies, although down, are no worse than at last January. Continually increased costs of production, particularly coal and incidental materials and probably transport, as this is to be nationalized immediately are producing a fresh crop of difficulties.

◆

PRODUCTION STARTS AT NEW PLANT OF CONTAINER CORP.

Container Corporation of America's new folding carton plant at Greensboro, North Carolina, begun in 1946, is now in limited operation. As the first of the company's fabricating plants to be built to its own specifications, the plant is a model of modern industrial architecture and efficient layout.

Designed by the Ballinger Company, architects and engineers, Philadelphia, Pennsylvania, with Walter Gropius, chairman of the Department of Architecture at Havard University's Graduate School of Design, acting as consulting architect, the plant includes many unusual features which add to the comfort, safety and convenience of employees. Other innovations provide maximum efficiency in the handling of materials, flow of production and maintenance. Scientific use of colors and artificial lighting to eliminate glare and eyestrain in all interior areas, loading and unloading facilities for freight cars and trucks within the well-heated, well-ventilated building, and interior wall surfaces of glazed tile, easy to clean, are typical elements of advanced design found in the plant.

◆

NEW SULPHATE PULP MILL AND OTHER MODERNIZATION AT BROWN CO. COMPLETED

Modernization for Brown Company, Berlin, New Hampshire, including the design and construction of a 200 ton per day sulphate pulp plant at the Burgess mill and increased stock preparation and papermaking equipment at the Cascade mill is nearly complete, according to The Rust Engineering Company, Pittsburgh, designers and builders. The Rust company worked with O. C. Schoenwerk, consulting engineer and the engineering department of Brown Company. (Cf. P.I. and P.W. Jan., 1948, p. 1404 for illustration of new plant.)

This modernization program, which began more than two years ago with the reconstruction of a dam in the Androscoggin River, will improve kraft papermaking equipment of the company and includes provisions for expansion.

The new pulp plant, built adjacent to a sulphite pulp plant at Berlin, will produce unbleached soft and hard wood pulp and store it in concrete storage silos. The pulp will be refined and made into paper at the Cascade mill, two and a half miles away. Two new 16-inch wood stave pipe lines will transport the stock to Cascade.

Equipment in the new pulp mill includes four digesters, including liquor circulating systems and a complete heat recovery system with accumulators to heat water for general plant use. Two blow tanks, two knotters and a three stage washer system have been installed. Also included is a set of quintuple effect black liquor evaporators.

A black liquor fired recovery boiler is designed to burn 680,000 lb. solids per 24 hours and have a capacity of 98,812 lb. of steam per hour at 700 Fahr., and 425 lb. per sq. in. pressure. A reinforced concrete chimney, 250 ft. high with a diameter of 10 ft., was designed and built by Rust.

The causticizing equipment consists of a rotary lime kiln equipped with green liquor clarifier tanks and white liquor clarifiers.

At the Cascade mill, kraft paper products will be made on a 196-inch

NEWS

A. O. SMITH

SLICED IN HALF. Remember the man who built a boat in his basement and then had to tear down a wall to get it out? Well, in this case A. O. Smith fabricated a 43 ft. long lined digester in halves and saved tearing down a wall to install it in an existing paper mill building.

TURN-ABOUT STRESS-ANNEALING. Even the longest of A. O. Smith's huge furnaces could not stress anneal all of this oil industry vessel at the same time; so one half was heated and cooled then the vessel was turned around and the other half stress annealed.

RECORDING 200,000 PSI TENSILE TEST. Through constant research in the field of high strength alloy steel weld metal, A. O. Smith is producing an alloy steel electrode whose weld metal strength is over 200,000 psi when heat treated.

paper machine erected in a building remodeled and enlarged by Rust. Rust purchased and installed a 22-inch mill water line of steel pipe paralleling the two stock lines from the new section of the Burgess mill.

Production of pulp at the new mill has begun and the entire expanded facilities will be in use soon.

◆

PLAQUE TO WAR HEROES UNVEILED AT NATIONAL GYPSUM ANNUAL MEETING

The annual meeting of the National Gypsum Company's 25 plant managers from throughout the country was held recently in Buffalo, New York. At the banquet held in Hotel Statler, the plant managers and executives honored Gordon H. Tarbell, who recently relinquished his active duties as vice president in charge of production. Mr. Tarbell, one of the company's founders, continues as a director and in an advisory capacity.

One of the highlights of the meeting was the tribute paid to the company's 23 employees killed in action during World War II. A plaque, dedicated to the Gold Star heroes, was unveiled in the company's headquarters.

◆

NEW POWER PLANT AND BOX MFG. PLANT UNDER WAY AT LONGVIEW FIBRE COMPANY

The Longview Fibre Company has begun construction of a new steam power plant at Longview, Washington. The entire plant will be completed by the middle of 1949, but individual units will go into service as soon as completed.

The new plant will be large enough to supply the Longview operation's entire present needs for electric power and steam. The plant and oil storage tanks, together with a hogged fuel pile, will cover an area of about 17 acres.

The new facilities will replace low pressure units with more efficient high pressure units. The steam generating units will consist of three 900-pound pressure boilers. One boiler will produce 100,000 pounds of steam from the black liquor recovered in the pulp cooking operation. The other two will have a capacity of 230,000 pounds each per hour when fired with oil or hogged fuel.

Steam from the boilers will pass through turbines generating electricity and after emerging will be used in the various parts of the plant for heat and other purposes. The new units comprise two turbines with an aggregate rating of 16,000 kilowatts. With turbines previously installed, the aggregate rating of all the company's generating facilities will become 24,500 kilowatts.

Another project under construction by the Longview company is a corrugated box manufacturing plant at Vernon, near Los Angeles. The plant is being built on a 7-acre site and will be supplied with container board from the Longview mill. The building housing the plant will be approximately 300 by 400 feet, constructed of reinforced concrete and glass. From 150 to 200 persons will be employed.

The factory is expected to be open in June. A. F. Knaggs will be plant manager, and Dan B. Phillips, box department foreman of the Longview plant, will be superintendent.

◆

UNITED PAPERBOARD CO. VOTES CHANGE OF NAME

The stockholders and the board of directors of the United Paperboard Company have voted to change the company name to United Board and Carton Corporation. The change became effective January 2. The change of name was decided upon when the directors recognized that the previous corporate name no longer adequately described the tremendously increased scope in which United now operates.

No change of address, officers or policies is contemplated. Officers are: Fred Enders, president; P. M. Loddengaard, executive vice president; H. W. Kephart, vice president in charge of sales; and W. H. Allen, sales manager of the Carton Division.

◆

PLAN FOR PAPER AND BAG PLANT IN TACOMA BEING CONSIDERED BY ST. REGIS

A recommendation that the St. Regis Paper Company build a paper mill and bag plant in Tacoma, Washington, is being made to the company's board of directors by Kenneth D. Lozier, assistant to the president.

Mr. Lozier made the announcement of his decision at Tacoma after discussing the project with business and labor leaders. The paper mill, costing $4,000,000, and the bag plant an estimated $1,400,000, exclusive of machinery, will employ between 500 and 600 persons, he said.

◆

ALPHA CELLULOSE CORP. LEASES SHOP IN ILLINOIS

A petition has been approved by the Circuit Court of Bloomington, Illinois, allowing the Gulf, Mobile and Ohio Railroad to lease its blacksmith shop in the west side yards of Bloomington to the Alpha Cellulose Corporation of Van Wert, Ohio.

The firm converts cotton and rag scraps into materials sold to paper mills. The firm said it would spend approximately $250,000 for installations and alterations, beginning operations with a staff of thirty-five persons and eventually expecting to employ about one hundred. The lease is to be for ten years with an option of a ten-year renewal.

◆

ARIZONA CHEMICAL CORP. BUILDS PLANT IN FLORIDA FOR TALL OIL REFINING

A new refining plant is being erected at Panama City, Florida, by Arizona Chemical Corporation, owned jointly by International Paper Company and American Cyanamid Company. Costing about $1,700,000, the plant is scheduled to go into production about a year from now.

In the new plant tall oil, which is derived from the liquor remaining after wood is cooked, will be separated into its component parts of vegetable fats and rosins. The plant will have an annual maximum capacity to process approximately 22,000 tons of crude tall oil.

◆

TENTATIVE PLANS MADE FOR NEW MILL IN ALBERTA, CAN.

Plans for a new pulp and paper mill in Alberta to cost an estimated $14,000,000 are under way. Prominent in the proposed plan is Montreal financier, R. O. Sweezy.

The tentative proposal calls for an integrated pulp, newsprint and wrapping paper mill. It is understood that newsprint would go to western United States publishers.

Mr. Sweezey indicates that initial production would be on a comparatively modest basis. Present available power is sufficient to operate only one newsprint machine, which would mean production of approximately 200 tons a day, or 60,000 tons annually. Mill construction will leave room for expansion, to an ultimate production of 600 tons a day. It is also proposed to install a wrapping paper machine which will take care of the mill requirements.

So far, the method of financing has not been announced. It is believed, however, that a method may be adopted similar to that outlined to U. S. publishers for the erection of a New Brunswick mill some months ago. If this procedure is followed, western U. S. publishers would probably be asked to subscribe a certain sum of money for every ton of newsprint for which they contract.

Neither provincial authorities nor mill backers have yet specified the

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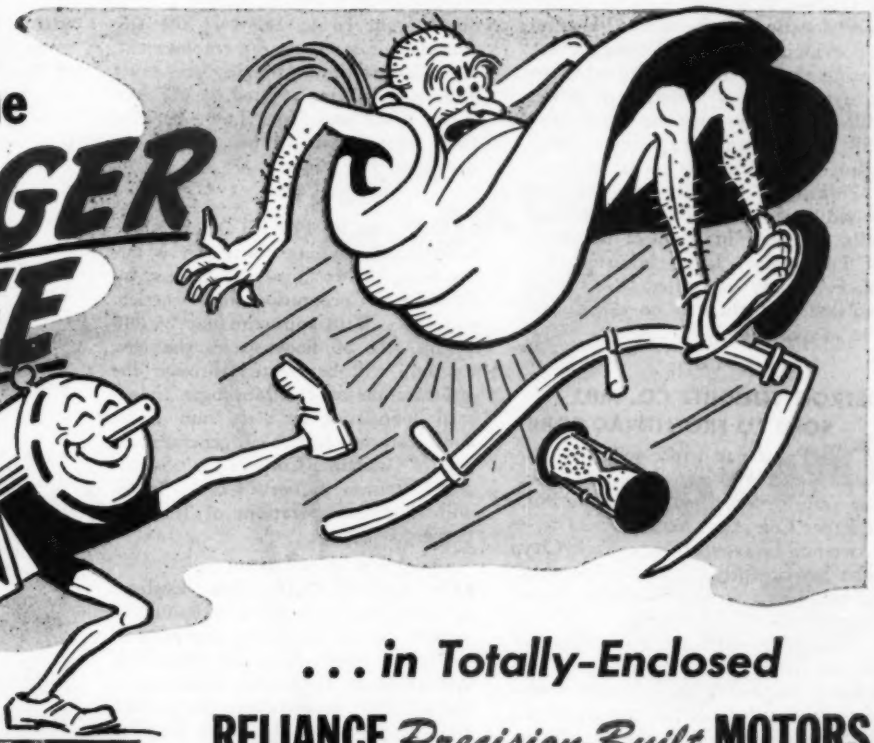

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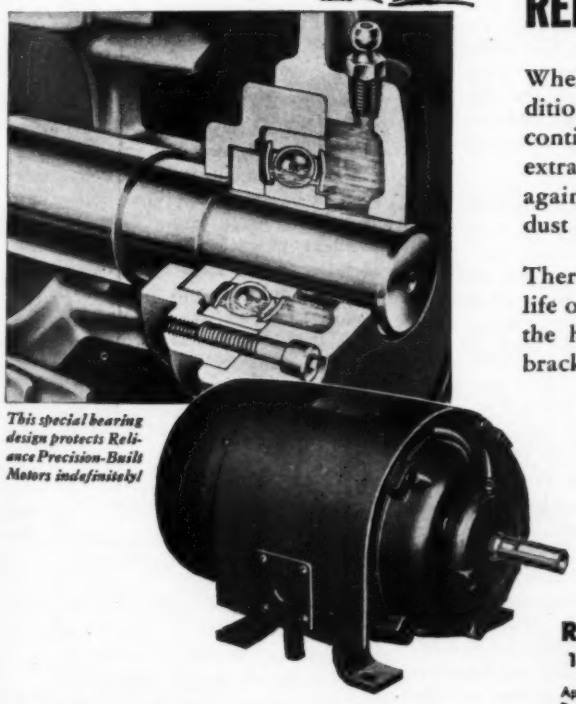

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exact location of the mill. However, a provincial spokesman is reported as stating that promoters were interested in natural gas as a source of power. Mill backers say that no expenditure will be required for power development, at least in the initial stages.

Pulpwood supplies for the mill would come from the Alberta foothills, probably in the area northwest of Edmonton. Lands Minister Hon. N. E. Tanner has stated that surveys indicate that there is no question of the adequacy of timber.

◆

DETROIT SULPHITE CO. MILL SOLD TO FRONTENAC CORP.

The Frontenac paper mill at Dexter, New York, owned and operated for years by the Dexter Sulphite Pulp & Paper Company, has been sold to I. Lawrence Lesavoy of New York City, who has organized a new corporation to be known as the Frontenac Paper Corporation.

Coincident with the announcement of the sale, the management of the Dexter Sulphite Pulp & Paper Company revealed plans for the construction of a new mill in which glassine paper will be manufactured. Construction may be started by early spring and completed by the end of the year.

▶▶▶ IN A SERIES of nine illustrated lectures, specially intended for engineering students, the Pulp and Paper Research Institute of Canada, has designed outlines of the scope of the technical work of the pulp and paper industry of Canada, and has been scheduled at McGill University, it was announced recently by Dr. Otto Maass, general director of the Institute. The lectures, held in the chemistry building, were started January 20 with Frank L. Mitchell, manager of the Canadian Pulp and Paper Association, as the first speaker.

◆

▶▶▶ MOST OCCUPATIONS in the logging of pulpwood were included among the saw-timber logging and sawmilling jobs for which an 18-year minimum age requirement is established for employment under the Fair Labor Standards Act. This was announced recently, effective this month, by Secretary of Labor L. B. Schwellenbach following his approval of a revision of Hazardous Occupations Order No. 4. Adopted in 1941, this order raised from 16 to 18 years the applicable minimum age for employment in most saw-timber logging and sawmilling operations covered by the Act —the Wage and Hour Law—because they were found to be particularly hazardous for minors.

◆

▶▶▶ A NEW PLANT to produce corrugated shipping containers is being built in Muskogee, Oklahoma, by Container Corporation of America, Chicago. With approximately 25,000 square feet of floor space, the new building will be erected through the co-operation of the Muskogee Industrial Foundation on a site now under consideration. J. R. Neil, general manager of Container Corporation's Southwest Division in Fort Worth, Texas, will supervise operations of the new property.

◆

▶▶▶ AUCKLAND, New Zealand, is to be the scene of a $10,000,000 project to develop large outputs of multiwall paper, bags and containers. According to D. Henry, chairman of the company undertaking the project, the company will build at Maraetai the biggest bag mill in New Zealand or Australia, with the first section in operation within a year. A pulp and paper mill at the same site also will be constructed and will feed two bag and container factories at Penrose.

◆

▶▶▶ CANADA'S PULPWOOD cut so far in 1947 was reported to be 127 per cent of 1946 during the same period. On this basis, the 1947-48 cut could run as high as 12 million cords providing that operations were maintained at the same levels.

◆

▶▶▶ AT A RECENT directors meeting the following officers of the Marathon Corporation (Rothschild, Wis.) were re-elected: D. C. Everest, president; Leo E. Croy, executive vice president; John Stevens, Jr., Allen Abrams, and R. J. Sund, vice presidents; A. M. Van Douser, secretary-treasurer; R. M. Altman, assistant secretary-treasurer, and Maynard T. Reierson, assistant secretary. Preceding the directors meeting, stockholders had re-elected the directors of the company.

◆

▶▶▶ THE LARGEST WINTER planting in the history of the Crown Zellerbach Corporation (Camas, Wash.) is now underway. The total area to be covered will include 5,100 acres, with 1,600 to be seeded by helicopter and 3,500 acres by hand planting. About 1,000 acres near Mist, Oregon, were seeded late in December, with a helicopter dropping 80 pounds of western hemlock seeds, 40 pounds of Port Orford cedar and 250 pounds of silver fir.

◆

▶▶▶ SALE OF THE Pacific Paper Converters plant at Redwood City (Calif.) to the Prudential Insurance Company and Remington Rand has been announced in San Francisco at a reported price of $130,000. The plant has 22,500 square feet of modern office, warehousing and manufacturing space, and the Prudential company has leased it to Remington Rand for 25 years with renewal options.

◆

▶▶▶ ENTRY BLANKS have been distributed for competition in the fourth annual $2,500 Trees for Tomorrow forestry scholarship program. Senior boys in thirty-three north central Wisconsin high schools are eligible to compete for the five $500 awards. The awards are based on previous interest shown in forestry, scholarship standing in class, an essay of 500 words telling why the applicant is interested in forestry as a career, and a personal interview before the district scholarship committee.

◆

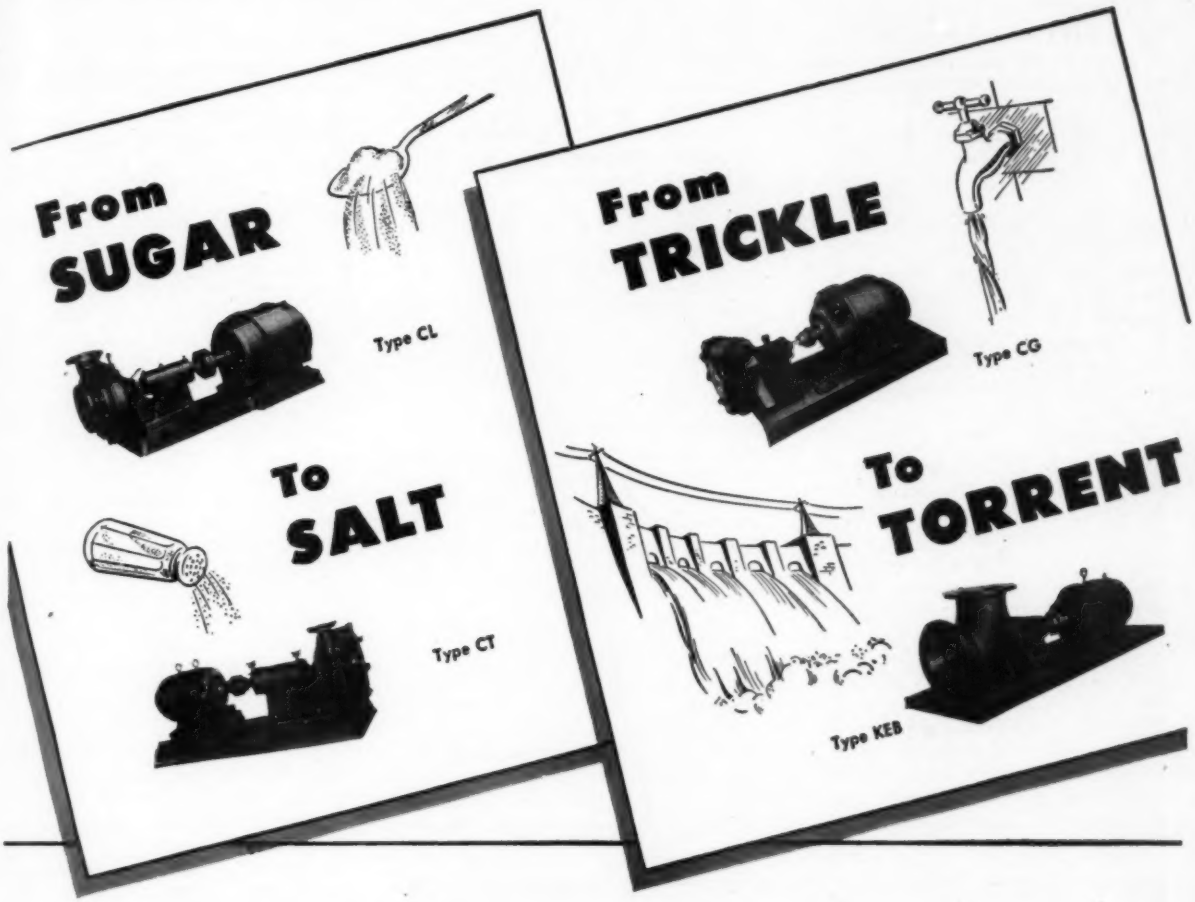
▶▶▶ THE MILL OF THE Crown Zellerbach Corporation at Port Townsend, Washington, is being expanded to provide facilities for converting part of its kraft paper production into multiwall kraft bags. According to resident manager Leo Ziel, the new development will add approximately eighty employees and increase the annual Port Townsend payroll by $250,000. It is described as the first venture by the company in the manufacture of multiwall bags. Bernard T. Miller, formerly with the Hammond Bag and Paper Company, will supervise the new factory.

◆

▶▶▶ JOB INSTRUCTION and job safety training course, sponsored by the British Columbia department of education, have been resumed at Pacific Mills' Ocean Falls pulp and paper mill, according to C. R. Rustemeyer, field officer of supervisory training, who is directing the projects.

◆

▶▶▶ PAPER AND PULP MILLS of Maine are planning to spend $25,000,000 for improvement in the next five years, according to Everett F. Greaton, executive secretary of the Maine Development Commission. In an address before the Brunswick (Me.) Rotary Club, Mr. Greaton said that in the last twenty-five years Maine has not lost a single major industry,



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and that 119 new industries have come to Maine in the last two years. He told of numerous new products being developed in Maine and declared that new types of paper are among the leading results of research.

◆

▶▶▶ AN EVENING COURSE on The Marketing and Sales of Paper and Paper Products will be conducted by New York University's Division of General Education starting February 11. J. Ronald Atwater, assistant to the president of the Mead Sales Company, New York, is chairman of the course.

◆

▶▶▶ FOUR PULP AND PAPER companies recently were cited before the Oregon state sanitary authority board to offer a plan to reduce pollution of streams by sulphite liquor. The Crown Willamette Paper Company, one of the four companies, informed the board it proposes to shut down operations at its Lebanon sulphite pulp mill for three months each year, when water in the Santiam river is low. Pulp production during the other nine months would be increased to build up stocks sufficient to feed the company's papermaking machines while the pulp mill is down.

▶▶▶ A FIRST HAND glimpse of industrial papermaking processes was offered to 131 members of the Niagara Falls Industrial Club when they recently toured the International Paper Company's Niagara Falls plant. Welcoming the group were H. P. Bailey, general manager of the company, and George H. Rand, Jr., assistant manager.

◆

▶▶▶ VANCOUVER ISLAND will be the site of a new $12,000,000 bleached sulphate pulp mill to be constructed by the H. R. MacMillan Export Company, Ltd. The mill is expected to be finished by 1950 and will employ over 200 persons. It will have a daily capacity of 200 tons of bleached sulphate or 225 tons of unbleached sulphate pulp, using nothing but by-products. The company's 1947 earnings of $7,128,000 will finance the mill.

◆

▶▶▶ UNDER A NEW PLAN announced by the Scott Paper Company (Chester, Pa.), a share of common stock is to be distributed to each employee with five or more years of service. Each person also will receive an additional share when he reaches the tenth service anniversary, the fifteenth, the twentieth, and each later anniversary constituting a multiple of five years. The distribution is not a bonus, but is described as a plan to enable every employee to become a Scott shareholder.

◆

▶▶▶ PURCHASE OF the Corrugated Containers, Inc., of Chicago, has been made by the Union Bag and Paper Corporation (Savannah, Ga.). M. Norian, its former president, has been appointed sales manager of the Chicago district. The plant will be enlarged and new machinery installed. Shipment of corrugated boxes to midwest customers will begin in March.

◆

▶▶▶ AUSSIE NEWSPAPERS soon will be reduced in size as a result of the new cuts in imported newsprint. According to a statement issued by the Australian Newspaper Proprietors' Association papers which use over 500 tons yearly will suffer a cut of 57 per cent, although the average cut will be 51 per cent.

◆

▶▶▶ CHAIRMAN OF THE Exposition Committee for the 1948 National Chemical Exposition to be held October 12 through 16 at the Chicago Coliseum is Dr. L. E. Clifcorn, director of product and process research at Continental Can Company, Inc. Dr. Clifcorn expects to concentrate considerable effort in enlarging and improving the educational exhibits which always have been an important factor in attracting attendance. The last show had a gross attendance of 45,424.

◆

▶▶▶ THE INDUSTRIAL PLANT at Augusta, Georgia, recently constructed for the Lily Tulip Cup Corporation of New York, has been acquired by the Mutual Benefit Life Insurance Company (Newark, N. J.) and leased back to the Lily firm for twenty-four years with three ten-year renewal options. It is reported that $1,300,000 was the purchase price for the plant which occupies approximately 200,000 square feet of land and contains office and manufacturing space. About 500 persons will be employed when the plant is in full production.

◆

▶▶▶ PLANS HAVE BEEN drawn for a reinforced concrete plant on a 4½ acre tract at Porland, Oregon, for Fibreboard Products, Inc. With an estimated cost of $661,000 it is part of a nation-wide expansion program for which the sum of $24,000,000 has been allocated.

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Houston, 2 . . . . . 2143 National Standard Building
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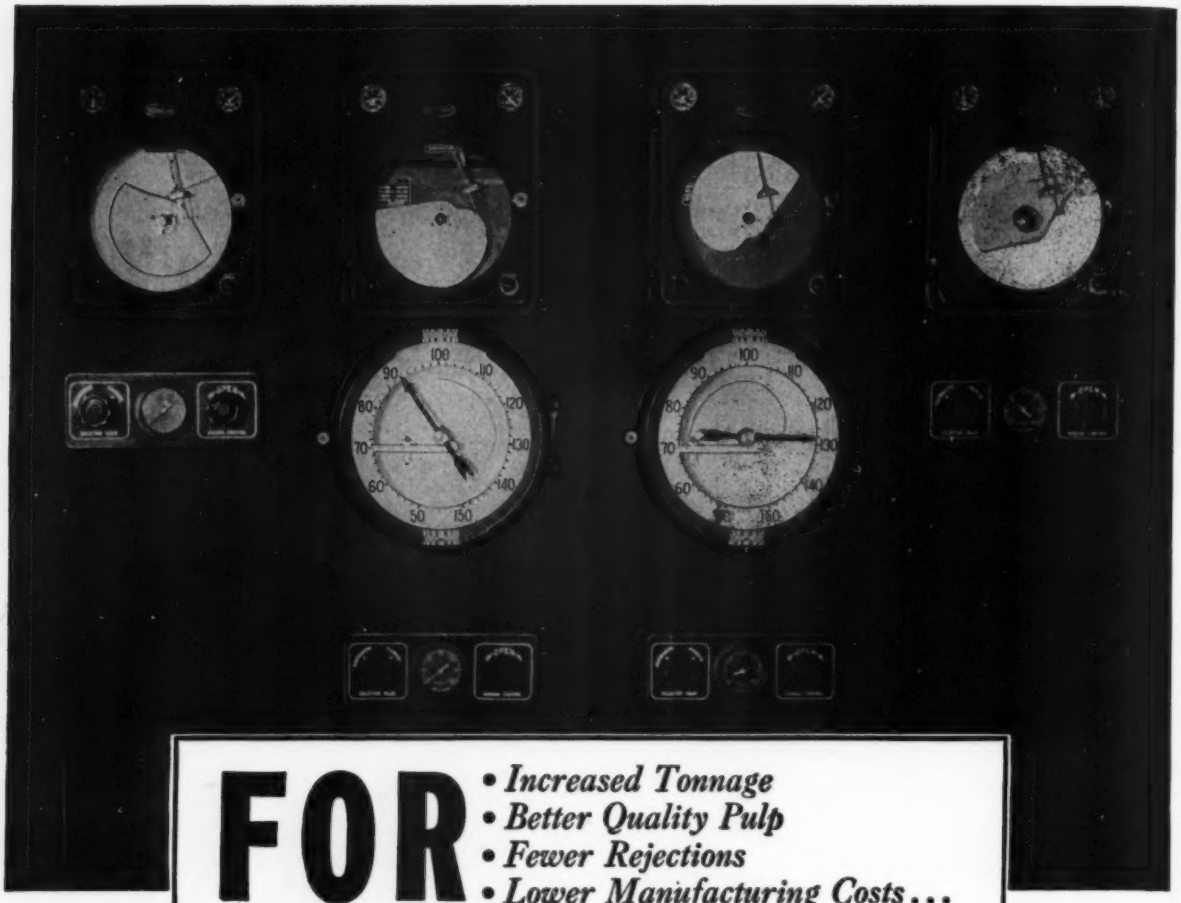

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Masoneilan Digester Controls do just that by taking the guesswork from the cooking process. Once a cycle is determined, these controls will repeat any selected program year after year. Here are the advantages Masoneilan Digester Controls give you —

A UNIFORM PULP — by holding a constant time and pressure schedule and by varying the maximum cooking temperature to compensate for variations in the amount of free SO_2 in the cooking acid.

FEWER REJECTIONS — by controlling the selected and maximum temperature schedule.

UNIFORMITY FROM COOK TO COOK — Masoneilan automatic time cycle controllers consistently repeat and record the pressure and temperature of successive cooks.

LOW STEAM CONSUMPTION — Program controllers prevent over-temperaturing — hence over-cooking. On indirect circulating systems hot condensate is returned to boiler house at considerable saving.

UNIFORM STEAM CONSUMPTION — cycle controllers allow for proper spacing of boiler load.

GAS RECOVERY — time cycle control of relief gas properly proportions it to the recovery process to keep uniform strength in the reclaimed acid.

GREATER PRODUCTION — accurate timing and scheduling of each cook produces greater tonnage.

INCREASED PULP STRENGTH — pop and fold strength increase due to uniformity of the temperature cooking schedule.

DECREASED BLEACHING COSTS — uniformity of pulp decreases the chlorine requirement.

Add your name to our list to receive new bulletin now in preparation

MASON-NEILAN REGULATOR CO.

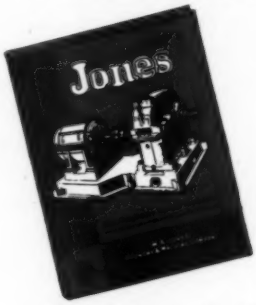
1196 ADAMS STREET, BOSTON 24, MASS., U.S.A.

SINGLE!
DOUBLE!
TRIPLE!

. . . . Every type of Herringbone Speed Reducer that you might need

Jones Herringbone Gear Speed Reducers are built in a wide range of ratios and ratings to cover every requirement. Single (Type SH) reducers in standard ratios range from 1.25 to 1 up to 11 to 1 in ratings from 1.3 to 440 H.P. Double (Type DH) reducers are built in standard ratios from 10.9 to 1 up to 72 to 1 in ratings from 0.5 to 275 H.P. The triple reduction reducers (Type TH) cover a range of ratios from 86.9 to 1 up to 355.8 to 1 in ratings from 0.3 to 78 H.P.

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Cast iron bases are available for all variations of motor assembly. Liberal stocks are carried to facilitate shipments.



Here's Complete Information About the Application of Herringbone Reducers

This 128-page catalog of Jones Herringbone Reducers presents a vast amount of data relating to Herringbone Reduction Units. Illustrations show a broad range of herringbone reducer applications and the technical information shows how to select reducers for all conditions of service in accordance with the A.G.M.A. recommended practice.

Write for your free copy of this valuable treatise

W. A. JONES FOUNDRY & MACHINE CO.
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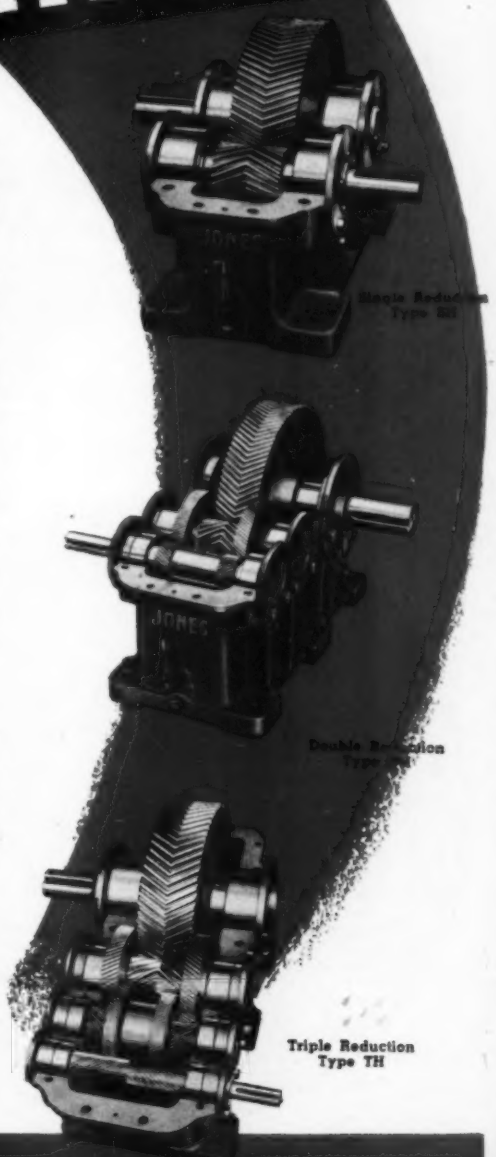


Single Reduction Type SH

Double Reduction Type DH

Triple Reduction Type TH

Jones

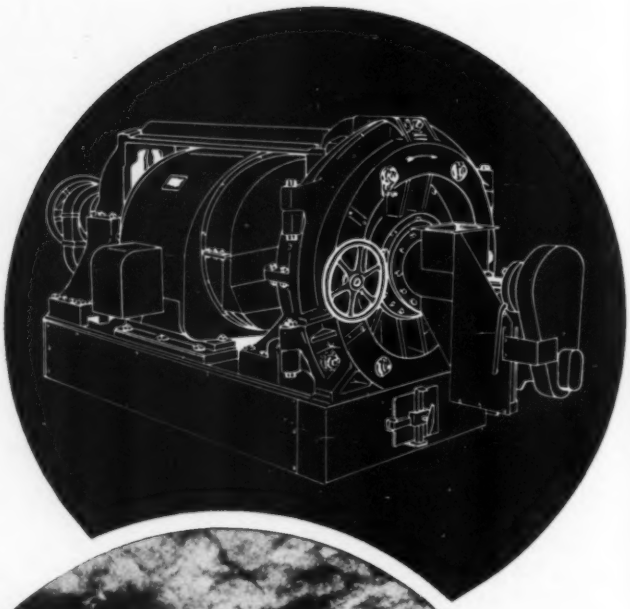
HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS
PULLEYS • GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • FLEXIBLE COUPLINGS

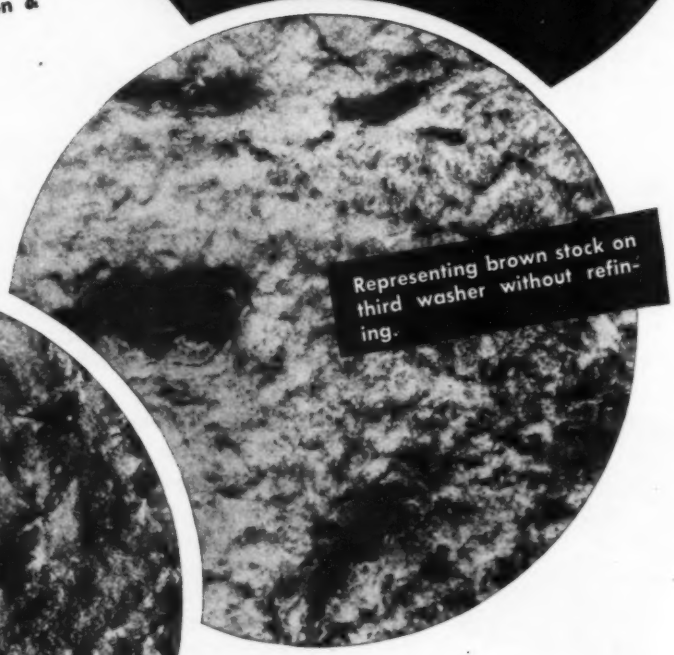
Brown stock refining in hot liquor . . .

Sprout-Waldron Refiners placed between the blow tanks and the washers save wood and chemicals, and permit improved evaporation.

Unusually high capacities on this service, with correspondingly low specific power inputs, make this SPROUT-WALDRON application an attractive investment for the Kraft Industry.

Let us consult with you regarding its possibilities in your plant. Sprout-Waldron & Company, Muncy, Pennsylvania.





Representing brown stock on third washer without refining.

Representing brown stock on third washer after refining.

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Manufacturing Engineers

Here's a guide for your Modernization Program

PARTIAL LIST OF PROCESSES INCLUDED

Acid preparation
Digesters
Chemical recovery
Causticizing
Pulp washers
Bleaching
Paper Making
Coating
Water treatment
Boiler Plant
Whitewater correction
Lime burning

This new, informative 80-page booklet is an important aid in paper mill modernization. It is a handy compilation of data on the instrumentation of twenty-seven significant paper mill processes.

The booklet has been designed to help you obtain better quality, greater output and lower operating costs with your present processing equipment. Included are 29 application drawings, photographs and page after page of informative data.

A copy will be sent to you gladly without cost or obligation. Write today.

Send For Your Free Copy today

THE BROWN INSTRUMENT COMPANY, 4489 WAYNE AVE., PHILADELPHIA 44, PA.
DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.
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Without charge or obligation, send me the new, informative, 80-page booklet entitled, "CONTROL INSTRUMENTS for the PAPER INDUSTRY".

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No. 1 of a series

from Western Precipitation Corporation — pioneers of the commercial application of COTTRELL *and now selling* COTTRELL *recovery equipment in all parts of the U. S. A. and foreign countries*

Important points to know about COTTRELL *Electrical Precipitators*

A COTTRELL Electrical Precipitator is a major plant investment. Once installed it is operated over a period of many years, *thus multiplying year after year the benefits of top notch design and installation.*

And because of the many factors affecting the operating and collecting efficiency of a COTTRELL Precipitator, probably in no other field do the experience and "know-how" of the organization designing and installing the unit play a more important role in influencing the overall performance of the installation. That is why it is so important to remember this fact . . .

Western Precipitation Corporation is the organization that installed the first successful COTTRELL *Precipitator over 39 years ago, still operating efficiently . . . and has consistently developed new refinements, new techniques, new applications that today have made it world famous in the science of recovering dusts, fly ash, mists, fogs and other suspensions from gases.*

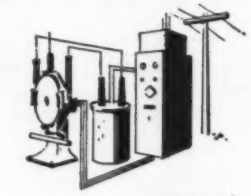
This is the first of a series of advertisements briefly outlining the important elements that go to make up a COTTRELL installation. Only long experience coupled with highest engineering ability, can assure the proper combination of these elements into a COTTRELL installation best suited to *your particular requirements*!

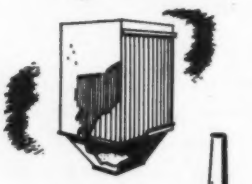
Basically, a Cottrell Precipitator consists of three major divisions each in turn consisting of many separate elements . . .

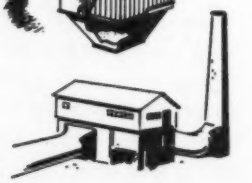
1. THE ENERGIZING SYSTEM, as its name implies, is the portion of the unit wherein the power is brought in, the voltage stepped up, then rectified to provide the unidirectional high voltage current supply for the Electrode System.

2. THE ELECTRODE SYSTEM consists of the high-tension ionizing electrodes and collecting electrodes through which the suspension-laden gas is passed to be cleaned. These electrodes can be of various designs, shapes and patterns and are equipped with various "rapper" arrangements which assist in keeping the electrodes clean of recovered materials.

3. THE HOUSING OR SHELL includes the structure containing the Electrode and Energizing Systems as well as the gas ducts and distributing system, the hoppers for receiving the collected material and other miscellaneous equipment.







Each of these three major divisions, together with their many individual parts, must be carefully engineered into ONE integrated and precisely-balanced unit to provide the successful and continuously-operating COTTRELL Precipitator. This series will take these major units apart to show in greater detail how the individual parts function and the varying types of design and construction. Watch for them.

10 COTTRELL ADVANTAGES

that make Cottrells unsurpassed for all types of recovery problems, hot or cold, wet or dry

1. **LOWEST DRAFT LOSS** — only a few tenths of an inch w. g.
2. **LOWEST POWER COST** — only ½ to 1 kwh. per 100,000 cu. ft. of gas cleaned.
3. **LOWEST MAINTENANCE COST** — all metal, few moving parts, no fire hazard.
4. **LOWEST LABOR COST** — operation can be fully automatic, if desired.
5. **LONGEST LIFE** — early Cottrell installations still operating after 39 years of continuous service.
6. **HIGHEST EFFICIENCY** — recovery efficiency approaches 100%, if desired.
7. **UNIVERSAL APPLICABILITY** — recover any suspension, solid or liquid — in any gas — over wide temperature ranges.
8. **ANY CAPACITY** — handle a few c.f.m. — or millions — with equal ease.
9. **MAXIMUM FLEXIBILITY** — readily adaptable to varying installation requirements.
10. **LOWEST OVERALL COST** — cost less per year of service, less per ton recovered. Often pay for themselves in a few months — always within a few years.

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1037 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

Do You Have This Helpful COTTRELL **Booklet? In 28 pages of interesting charts, illustrations and descriptive data, it answers many of the questions engineers ask about** COTTRELL **design and construction. Send for your free copy. Ask for Bulletin C103!**

Our service simplifies

your paper work!

When you have paper production problems
remember that STEIN-HALL—
with its years of "know how"—
is eager to be of assistance.

Our salesmen...
more than just selling quality starches,
dextrines and gums...
are technical experts
...versed in applying these products
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And those questions which
our salesmen cannot answer...
we will turn over to our fully staffed laboratory,
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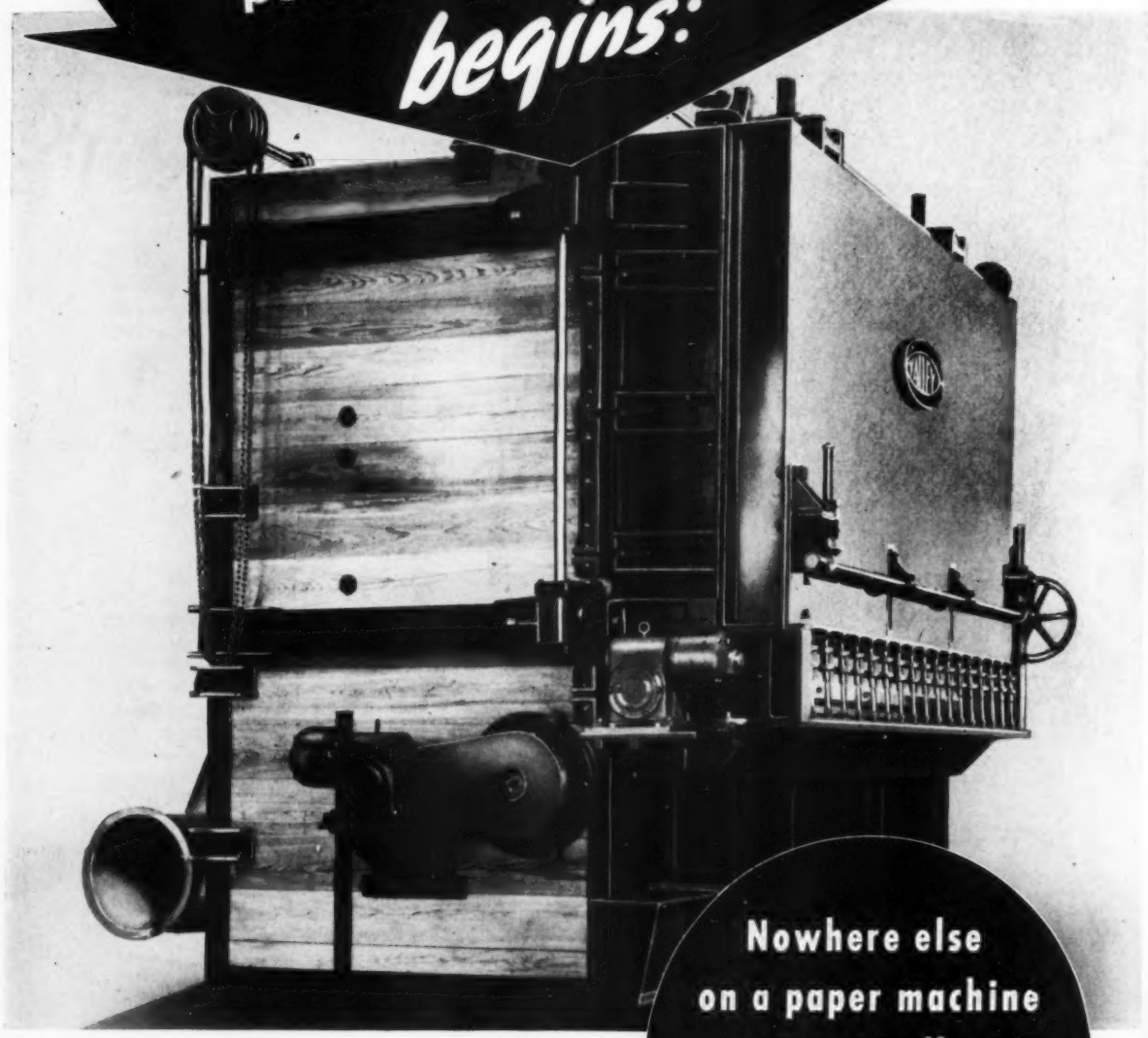
STARCHES, DEXTRINES AND GUMS
for the Paper Industry
LABORATORY-CONTROLLED FOR QUALITY
AND UNIFORMITY

STEIN SH HALL

This is where a perfect shipping roll *begins:*



Nowhere else on a paper machine can so small an investment pay such big dividends!

You will get *better* results from inlet and head box by Valley.

VALLEY IRON WORKS CO. Appleton, Wisconsin

FORMATION CALIPER LEVEL SHEET INCREASED SPEED HIGHER TEST

WHAT EVERY PAPER MAKER *KNOWS...*

No single type of Dryer Felt will suit the requirements of all mills — or even all positions on the same machine.

That is why HOOPERWOOD "Canvas Engineering" has produced not one but several distinct types of Cotton and Asbestos Felts — a service of real assistance to many Paper Mill Superintendents.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD has the felt to fit the need.

Make your next dryer felt *right* — specify HOOPERWOOD.

And for your Carrier Rope requirements, specify HOOPERWOOD-Sheahan Carrier Rope. Until Hooper engineers designed this high-grade product, rope of comparable quality was obtainable only from foreign sources.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: **WOODBERRY, BALTIMORE, MD.**

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

NOW an EVEN BETTER DISSTON CHAIN SAW

with Mercury Gasoline Engine

TWO NEW FEATURES ADDED

AUTOMATIC CHAIN LUBRICATION

An improved feature that provides many important advantages.

It has been relocated from tail stock to engine, thus adding extra protection to clutch lever and providing other advantages.

Transmission is lubricated independently from the Automatic Chain Lubricator—thus a wider variety of lubricants are suitable for oiling the chain.

The cam-operated pump develops positive pressure with each turn of sprocket . . . and applies it automatically, in any desired volume, all the way to point of outlet. Flow shuts off, the instant clutch is disengaged. Pressure prevents saw dust and other foreign matter from working into oil line and clogging it.

Flow of oil is constant for any position encountered in felling and bucking.

Will stand up better in service because there are no exposed oil lines to break or mash.

Easy to refill, simple to operate and keep in top working condition.

Can be easily installed on all previous models of the Disston Chain Saw.

CRADLE BALANCED TAIL STOCK

Stronger, more compact, safer . . . Provides better leverage and easier manipulation in cut.

It is designed and shaped to fit the operator's arm . . . the fulcrum being at the front end of tail stock. Thus operator uses the entire body of the tail stock for maneuvering in cut. Note addition of abutment plate which allows upward bucking cuts to be made from the tail stock end.

Completely encased to protect operator's hands . . . no slots where fingers are exposed to cutting chain.

New simplified tensioning device meets individual requirements . . . all degrees, from a very loose chain to one that is 100% tight.

Can be quickly detached should saw get stuck in cut.

Because of simplicity of design, cleaning is easier and quicker.

Made of toughest grade of aluminum alloy and of permanent mold construction throughout, providing greater rigidity.

PLUS THESE DISSTON EXCLUSIVE FEATURES

- 11-h.p., 2-cylinder engine, designed specifically for Disston Chain Saw.
- Detachable Air Filter keeps dust from carburetor.
- Die Cast Engine Cylinders.
- Positive-acting, non-slipping, multiple disc clutch.
- Cutting Chain of specially heat-treated Disston Steel.
- Guide Rail of Disston Steel, reversible end for end, top for bottom.
- All Controls within easy reach of operator.
- Built-in Magna-Pull starter, no ropes to wind or lose.

Available NOW. Get in touch with your distributor.

HENRY DISSTON & SONS, INC., 264 Tacony, Philadelphia 35, Pa., U. S. A.

KELGIN *smoothes the way...*

FULL BRILLIANCE *of* HIGH GLOSS INKS

Maximum brilliance of high gloss inks; true color values and clean, sharp printing are assured when you use Kelgin, the modern algin surface sizing agent, in the preparation of your paperboard.

Kelgin forms an excellent film barrier — helps produce a paperboard surface that is perfectly sized for smoothness and density—makes possible controlled and even penetration of printing inks, oils and waxes.

Easy to handle, Kelgin is soluble in both hot and cold water. It is adaptable to water box or size press application — will not produce picking, foaming or sticking to the rolls. Kelgin also eliminates or greatly reduces the curl tendencies of your sheets without the need of sizing the back of the sheet.

Kelgin is a rigidly processed product of nature, free of impurities, and extremely economical to use. It will pay you to investigate its adaptability to your particular needs. A request to our Technical Department will bring you the full story.

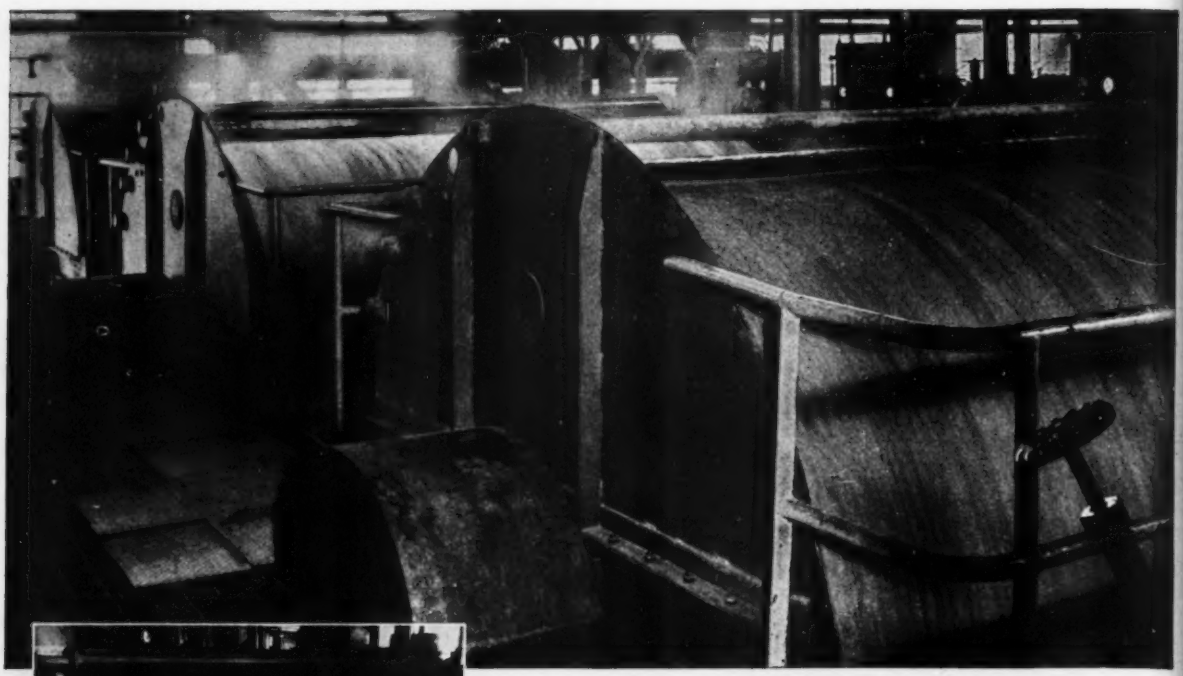
KELGIN ... A PRODUCT OF

KELCO COMPANY

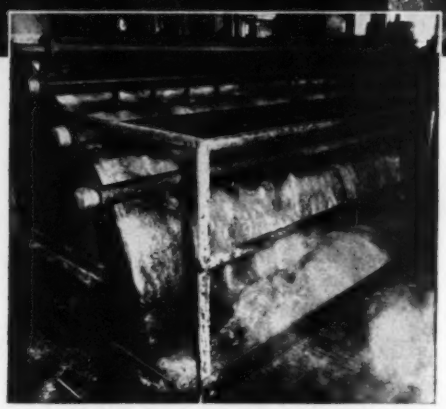
KELGIN REFINED ALGIN PRODUCT

20 N. Wacker Drive, CHICAGO—6 | 31 Nassau Street, NEW YORK—5 | 530 W. Sixth Street, LOS ANGELES—14

Cable Address: KELCOALGIN—New York



Three-drum five-stage Swenson-Nyman Pulp Washing System in operation on Kraft board pulp.



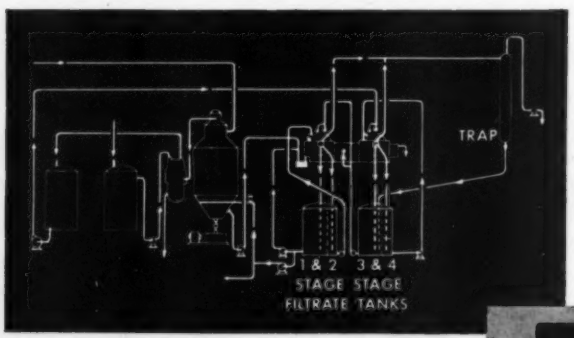
Close-up showing sheet formation and liquor shower arrangement on middle drum of same installation.

PULP WASHING

with less dilution lower chemical loss lower steam consumption

The Swenson-Nyman Pulp Washer, now in operation in many leading pulp mills, is bringing substantial economies in both chemicals and fuel. Closed system eliminates spillage and low dilution, reduces the evaporator load, and hence steam requirements.

Today's trend is toward an increasing number of washing stages, with repulping between drums. Each drum of the Swenson-Nyman Pulp Washer provides 2-stage washing. Four, five, and six stages of washing are practical. Fully described in Bulletin F-104 . . . free on request.



Flow sheet of a 2-drum, 4-stage installation

- Black Liquor Evaporators
- Pulp Washers • Lime Sludge Filters
- Causticizers • Digester Blow Condensers
- Surface Condensers
- Kraft Pulp Deckers

SWENSON

SWENSON EVAPORATOR COMPANY

Division of Whiting Corporation
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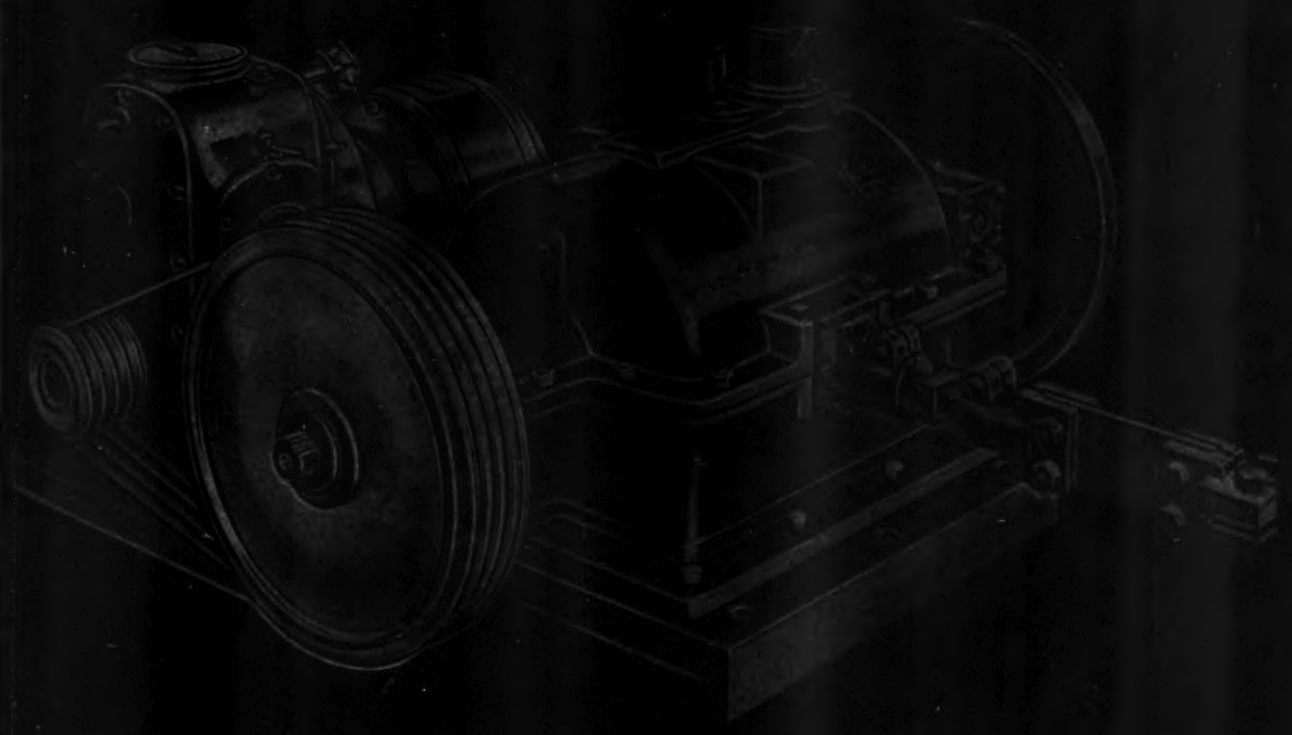
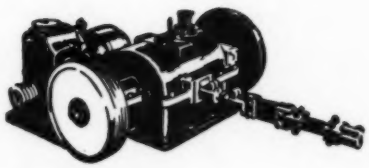
SIMPLEX SHAKES



SELF-CONTAINED, COMPACT, VARIABLE SPEED



This is the most compact, self-contained shake in use today. By installing two or three of these simplex units, the fourdrinier may be given varying degrees of shakes at different points along the forming table. This permits control of water carried on the wire and improves formation. Adjustment of speed and stroke can be made while machine is running.

Bagley and Sewall Simplex Shakes are operating successfully on hundreds of machines throughout the world. Write us regarding your requirements.

BAGLEY & SEWALL

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY

WATERTOWN, NEW YORK

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LIQUID or DRY

STARCH CONVERTER

for

TUB SIZING
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MACHINE COATING
LAMINATING ADHESIVES

R. T. VANDERBILT CO., Inc.

230 Park Avenue, New York 17, N. Y.

EDITORIAL

Lawful or Awful

▶▶▶ THE GALLANT old law of demand and supply has had a most spectacular and fantastic operation during the past six years.

This all came about because of the deliberate intent by a coterie of tinkering crackpots in Washington (who resorted to every conceivable subterfuge) to thwart the natural operations of the law of demand and supply by unnatural controls.

The scheme made its appearance before our entrance into World War 2 in the shape of a priority system of supply for the defense period. It continued throughout the war and even after V.E. and V.J. Days, ending in the futile follies of regimentation of industry, rationing of commodities and the imposition and continuance of the nefarious OPA controls.

It is a miracle that this country survived these assaults upon its economy and that it is now slowly, but surely, emerging from the benumbing of its over-all production processes and the stifling of our free enterprise system.

This wanton and fantastic experience, of course, had to end in failure because in spite of every restraint put upon it, the gallant old law of demand and supply kept right on operating. The would-be economists could not prevent that, but they did succeed in bringing a great confusion in the minds of the people and in the minds of many production operators in commerce and industry. The confusion was the result of a lack of understanding and trust in the immutability of the law. They forgot, the nonce, that the law of true economics is the law of God; that "the law of the Lord is an undefiled law." "He hath made them fast for ever and ever, He hath given them a law which shall not be broken."

No, despite all attempts and assaults devised by clever schemers, the law was not broken, but our fantastic experience of the past six years has well nigh broken us.

It was not by chance that the law was christened "The law of demand and supply." Demand first, supply second. For, by its very annunciation, we are bid to first locate a demand for a commodity and then supply it because it was found to be uneconomical to create a supply and then proceed to find a demand for it later.

Further, it has been determined that whenever the demand for a commodity is greater than the supply, the price automatically rises, but when the supply of a commodity is greater than the demand for it, the price automatically declines.

That is the law. Its authority has been established for ages. It is set fast and cannot be amended except at a tremendous cost to morale and a hideous material loss.

Our spectacular and fantastic experiment for the past six years is coming to its finis. We are emerging from the confusion with which it was surrounded. But, this nation is facing the crushing load of debt incurred principally by the stupid attempt to set the laws of God at naught. Get back in conformity with the law. Get in line quickly lest automatically you get out of business.

Eventually, we shall return to the prewar, unobstructed, natural operation of the law of demand and supply and underwrite anew free enterprise, the wondrous way of life for America.

The Cost of Accidents Is UP

▶▶▶ AMERICA IS STILL at war, and that enemy is the most deadly foe that threatens the everyday lives of its people. This war is costly—as are all wars—and like any conflict, the price is far greater than the cost.

In dollars and cents, the cost of all accidents in America last year totaled $6,700,000,000, but the human suffering and loss of manpower are far beyond any evaluation.

The National Safety Council reveals the startling fact that the 1947 all-accident death rate was 69.7 per hundred thousand population. Deaths from occupational accidents in 1947 totaled 17,000—about 3 per cent more than in 1946. Total all-industry employment increased about 5 per cent, with manufacturing employment alone up 9 per cent. Disabling injuries from work accidents numbered approximately 2,050,000.

The economic loss from occupational accidents totaled about $2,500,000,000. Deaths to workers from all accident causes totaled 54,500—17,000 on the job, and 37,500 off the job. This is a 4 per cent increase. Injuries were about 5,500,000. Total time lost was 450,000,000 man-days equivalent to the shutdown of plants with 1,500,000 workers.

Not very good news, but facts that must—and will—penetrate the consciousness of every employee in every industry. Safety must be regarded as a vital part of our national economy.

Some good news, however, comes from the paper manufacturing field.

The latest report of the Paper Industry Safety Contest (not yet published) shows a splendid record by contestants for the first six months of the present contest (including December). The National Safety Council states that the first half of this contest shows the participants recording a reduction of 14 per cent, in comparison with their rates for the same time in the previous contest.

Paper industry management has renewed its pledge to bring down that accident curve. In addition to participation in national contests, many of the companies are conducting highly effective campaigns within their own mills. One of these, the International Paper Company, has just released some interesting data showing a splendid accident reduction in its mills since 1917. This company also marks its 50th anniversary with a Safety Campaign in all of its mills. This campaign, which began January 1, will last through June 30. The slogan adopted is "100 Days Without a Lost-Time Accident."

There is the bright prospect that out of the chaotic conditions in which we now live, the safety of humanity will be the first concern of the nation. On the job or off the job, the National Safety Council's motto should be adopted by every worker:

"Be Careful . . .

the Life You Save May Be Your Own"

There's nothing mysterious about it. It's just the use of modern techniques that everyone, including builders, says is necessary to increase production and decrease the cost of houses. It is the use of engineering applied to small home construction in order to conserve materials through more intelligent usage. It is the mechanical handling of building materials, the processing of same by use of modern machines, and their subassembly in accurate templates by workmen, most of whom require no special trade skills.

"Panel-Houses" for Industrial Communities

WILLIAM SIBLEY

▶▶▶ WITH CONSTANT movement and migration within many industries (paper and pulp industry included) not infrequently some company faces the need for completely building its own community for its employees. A case in point:

Far out in the western end of Kansas, near the little town of Ulysses, the Cities Service Gas Company graded down a couple of wheat fields and built a new natural gas compressor station and other necessary facilities for pumping gas through its 26-inch "Big Hugoton" natural gas pipe line to distant eastern communities. With nothing in sight, in any direction—except more wheat fields—how were the fifty trained and skilled employees, with their families, to be housed? Since this was a business requiring round-the-clock duty by day and night shift operators, something had to be done to house those 150 to 225 people. They couldn't (and wouldn't) revert to tents or sod huts.

The answer lay in the war-taught lessons in "prefabrication." Of the eighty-odd companies now making factory-built, panel-homes, relatively few offer a complete community building service which extends from the original land surveying and evaluation, through plot planning, to water main and sewer laying, street paving, curbing, sidewalk laying and house provision and erection. One such company, however, is the Crawford Corporation, of Baton Rouge, Louisiana. After contacting and contracting the Crawford Corporation for the required number of houses, a recent Cities Service Gas Company advertisement said: "When the station is ready to run, these employees will be moved into attractive new cottages—two- and three-bedroom structures—with modern, complete kitchen, bath, and heating equipment, everything complete to the keys. Streets through the village will be paved, curbs in, sidewalks laid, boulevards, yards and grounds landscaped." Brother! There is labor relations with a vengeance!

It is unfortunate that the words "prefabrication" or "prefabricated" have been bandied about so freely and loosely during and since the war that they have come to connote in the average man's mind something akin to "cheapness," "stereotyped," "identical in appearance," "temporary," etc. Nothing could be farther from the truth.

When speaking of such "prefabricated" houses as Cities Service Gas bought, there is no thought of some oversized trailer, a homette, or a hut. True, there are some "prefabricated" houses being sold today (due to the existing critical emergency) that are little more than a good 2-car garage and which will doubtless contribute to slums in a few years hence. This is doubly unfortunate, since these few exceptions give prefabrication a still further setback. What we really have in mind, when speaking of houses such as those erected for Cities Service Gas employees, is a house that fully complies with the standards of the National Bureau of Standards, or more than meets the construction requirements of FHA for mortgage insurance.

These are well-designed, conventional-looking houses usually of one or one-and-a-half stories that are erected by small home builders, and they are generally indistinguishable from any other homes in the community.

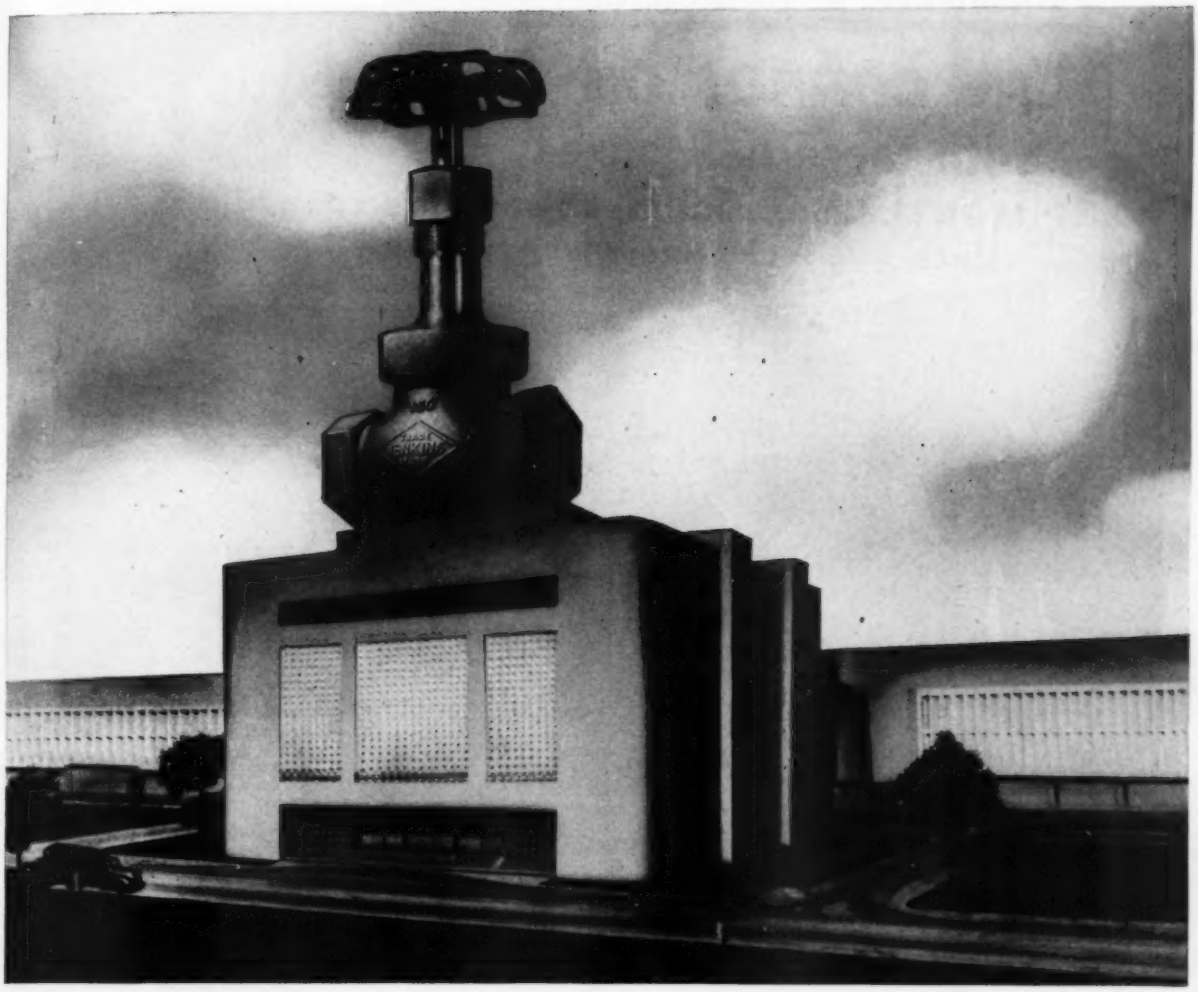
The chief distinction is that these prefabricated houses are erected in a matter of a day or two from floor, wall, ceiling, and roof sections which are built under the better working conditions obtainable in a modern factory. In other words, the work on the site is limited to that of assembly and finishing.

It is not the answer to every housing problem. The principal product of the industry is in the field of small, detached homes, mostly of frame construction, which are shipped directly to the site by truck to more than 1,800 contractor-dealers who are finding that they can complete these houses in three weeks instead of three months. They know, more accurately, their finished costs; they build throughout the winter months and end up with a better house.

Through the economies of direct purchasing from primary manufacturers and the elimination of waste time, labor, and material, factory fabrication can reduce the prices of small homes by 20 per cent or more. Or, on the other hand, give the owner more than 20 per cent greater value for his dollar.

Industrial communities (villages and towns of geographical necessity built by a single company) have, since the days of George M. Pullman and before, been a combination financial problem and labor relations headache. Today, however, there are builders of panelized homes who have taken their jobs and opportunities seriously. Such concerns frequently start with an airplane view of the property, that every advantage may be taken of topography, river, creek, pond, nearby arterial highway, etc. Plot planning becomes a science involving curving streets, reduced traffic speeds and fire hazards, commercial centers that change shopping from a chore to a pleasure, recreational areas located on low-cost ground, yet available to all sections, religious and educational institutions properly located. Then, finally, houses that give much greater dollar value than could be obtained by conventional piece-by-piece site erection methods.

Yea verily, the world do move. At last, one industry most backward in the matter of mechanization (home building) is "going moderne."



There's Truth in this "Tall Story"

IF YOU THINK of *all valves* in this plant as *one valve*, you'll see the truth in this trick photo. Valves, collectively, represent one of the biggest investments in equipment in any plant.

That's why, with wages and material costs higher than ever before, it is just as important to keep a sharp eye on valve maintenance as it is on operating costs of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but, multiplied by thousands, it becomes a serious drain on operating budgets.

JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering service for lowest valve costs in the long run. *Sold through leading Industrial Distributors everywhere.*

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

"PREVENT VALVE FAILURE" is a 28-page guide to valve economy, fully illustrated, with case histories of valve damage, and recommendations for its prevention by proper selection, installation, inspection, and maintenance. FREE on request. Write JENKINS BROS., 80 White St., New York 13, N. Y.

LOOK FOR THIS DIAMOND MARK

SINCE 1864

JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

NO CORROSION HEADACHES with these headboxes . . .

MONEL lining and stock contacts resist attack by stocks and white waters

Monel-lined headbox and Monel slice used in the manufacture of white and colored papers. All stock contacts are of Monel. Machine speeds are 110 – 1200 ft. per minute. Made by the Valley Iron Works, Appleton, Wisconsin.

With Monel* guarding against corrosion, headboxes and slices made by the Valley Iron Works will require only a minimum of maintenance service.

For Monel resists the corrosive action of acid and alkaline stocks, and machine white waters. Merely rinsing with fresh water keeps Monel surfaces bright and prevents the accumulation of slime and fibre.

Monel is rustproof, tough, and stronger than structural steel. Yet it is easily fabricated. It can be cut, bent, and welded by ordinary shop methods. Important too, Monel does not react galvanically with copper, brass and bronze.

Leading paper manufacturers report substantial savings through using Monel in wet-end applications such as save-all pans and trays, suction boxes, rolls, rail covers, fastenings, doctors and slices, as well as for headboxes and linings.

Just as Monel helps make Valley Iron Works' slices and headboxes longer-lasting and trouble-free in operation, it can cut corrosion losses in your own plant. *Replace with Monel, and watch maintenance costs go down.*

To learn more about how INCO Nickel Alloys can help you solve production problems, write for: "Monel, Nickel, and Inconel in Pulp and Paper Mills."

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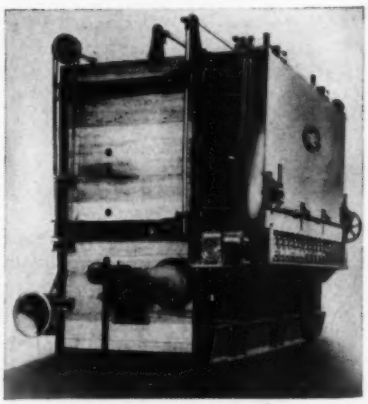

Monel-lined headbox and Monel slice for use on paper machine making kraft paper for bags and wrappings (30# to 121# weight). Operating speeds are 300 – 1000 ft. per minute. All stock contacts are of Monel. Made by the Valley Iron Works, Appleton, Wisconsin.

EMBLEM OF SERVICE INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

MONEL . . .
for lower maintenance

2 New GOULDS PUMPS!

The "SUPPORT-HEAD" Centrifugal . . .

26 sizes . . . capacities to 3000 G. P. M. . . . heads up to 400 FT., depending upon capacity

Extra-heavy, well proportioned construction throughout the "Support-Head" series assures trouble-free operation 24 hours per day under the most severe service conditions.

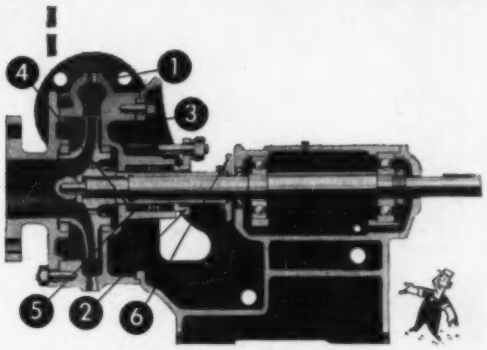

FIG. 3750

✓ CHECK THESE IMPORTANT "SUPPORT-HEAD" FEATURES:

1. Volute casing bolted to support-head with recessed lock fit to assure alignment. No stud or bolt holes tapped through casing to liquid ways.
2. A new split gland makes it unnecessary to unbolt gland halves when repacking stuffing box—saves time.
3. Full, open-top construction permits ready access to gland and stuffing box, important where pump is in an inaccessible position.
4. Shaft sleeve covers full length of shaft, completely protecting shaft from liquid damage. Shaft sleeve expands or contracts with temperature changes—prevents buckling and distortion.
5. Stuffing box is regularly provided with die-formed, semi-metallic packing. A mechanical seal may be substituted where preferred (unnecessary to remachine stuffing box).
6. Liquid deflector prevents leakage of liquid into motor bearing and is drilled and tapped so that in servicing it can be used to prevent shaft rotation while removing or tightening impeller nut; also to remove sleeve . . . a time saver.

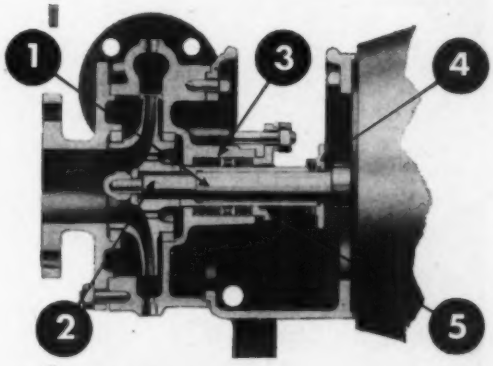

FIG. 3650

The "CLOSE-CUPLD" Centrifugal . . .

17 sizes . . . capacities to 2000 G. P. M. . . . heads up to 400 FT., depending upon capacity

Compact, ready to install and featuring several important operating advantages, Goulds new "Close-Cupld" Centrifugals answer a broad range of requirements *at low cost.*

✓ THESE FEATURES SAVE TIME, PROLONG PUMP LIFE:

1. Compression seals between shaft sleeve and impeller hub and sleeve and shoulder on shaft completely protects shaft from liquid damage—prolongs life of pump and motor.
2. Unlike most pumps, shaft sleeve is free to expand or contract with temperature changes—prevents buckling and distortion.
3. Machined stuffing box designed for die-formed, semi-metallic packing or mechanical seal *without* necessity of making changes . . . gives you operating flexibility.
4. Liquid deflector, mounted on end of shaft sleeve is drilled and tapped so that it can be used to prevent shaft rotation while removing or tightening impeller nut; also, to remove sleeve . . . saves time.
5. New split gland simplifies repacking of stuffing box, when necessary, another time saver.

GET THESE NEW GOULD'S BULLETINS!

GOULDS PUMPS, INC.
DEPT. PI-2 , SENECA FALLS, N.Y.

Please send me bulletins checked below!

☐ New "Support-Head" Pump Bulletin 715.1.
☐ New "Close-Cupld" Pump Bulletin 710.1.

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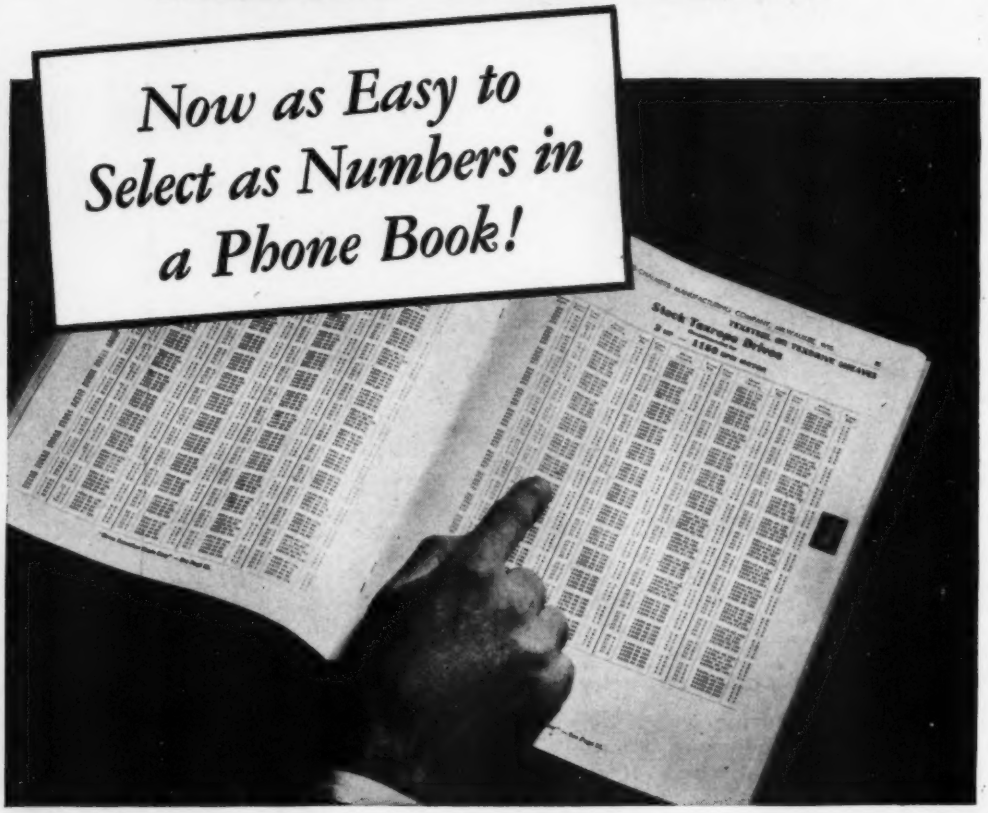
Pre-Engineered
TEXROPE V-BELT DRIVES

TEXROPE .. Greatest Name in V-Belt Drives



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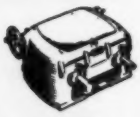
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.



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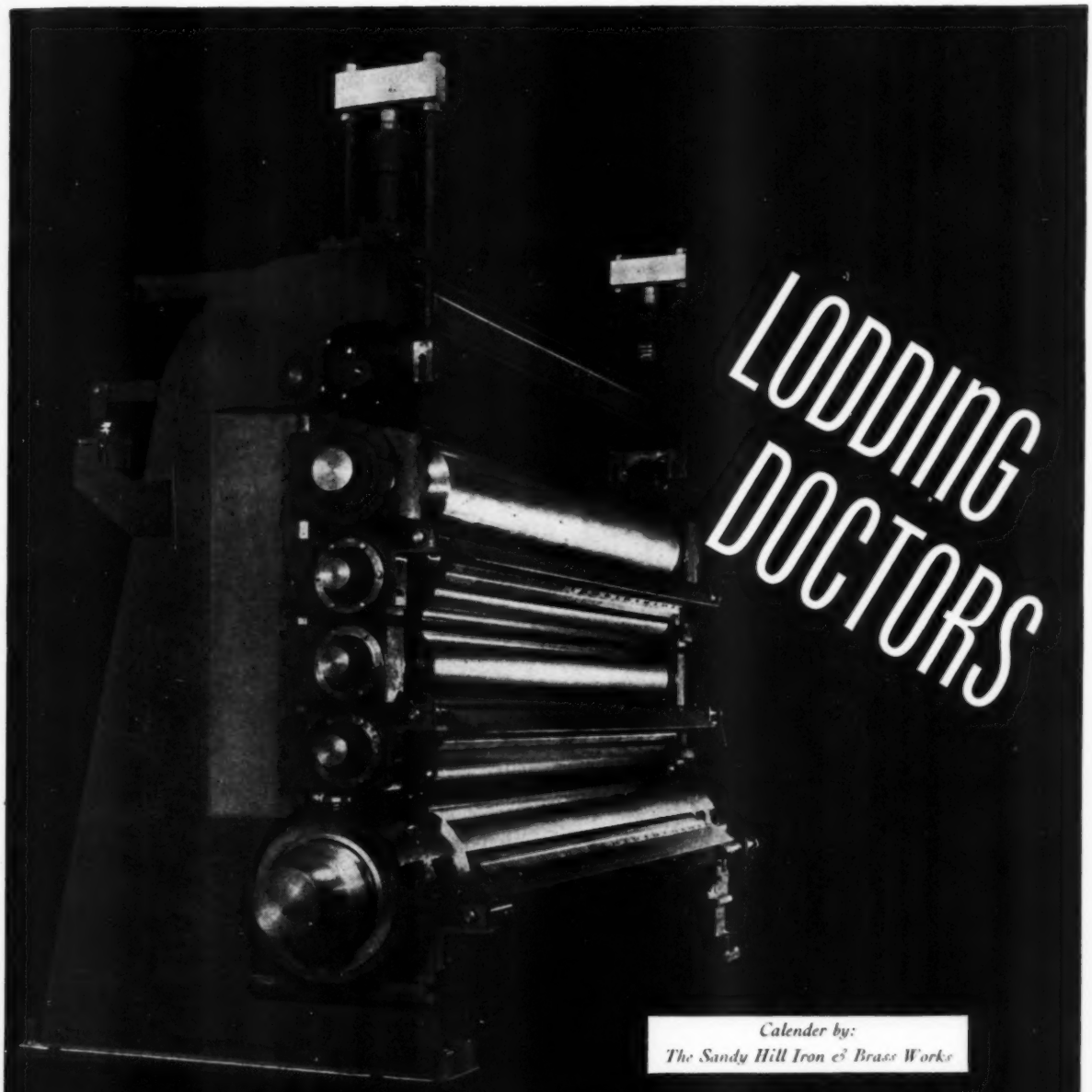

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Calender by:
The Sandy Hill Iron & Brass Works

Engineered for *every* position on *every* machine by Lodding Engineering Corporation, Worcester, Massachusetts, U. S. A.

Represented outside New England by W. E. Greene Corporation, Woolworth Building, New York.

NOW! TAPER-LOCK* FLEXIBLE COUPLING!

It's new! It's different! A packaged Flexible Coupling . . . available from stock . . . and ready to install *without reboring*. It's another Dodge development for mechanical power transmission that saves time, cuts cost!

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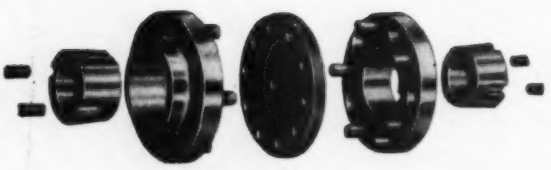

- ✓ Built with the famous TAPER-LOCK bushing (patented).
- ✓ Available from stock in a wide range of standard bores. *No reboring!*
- ✓ Fastens to shaft with the firmness of a shrunk-on fit.
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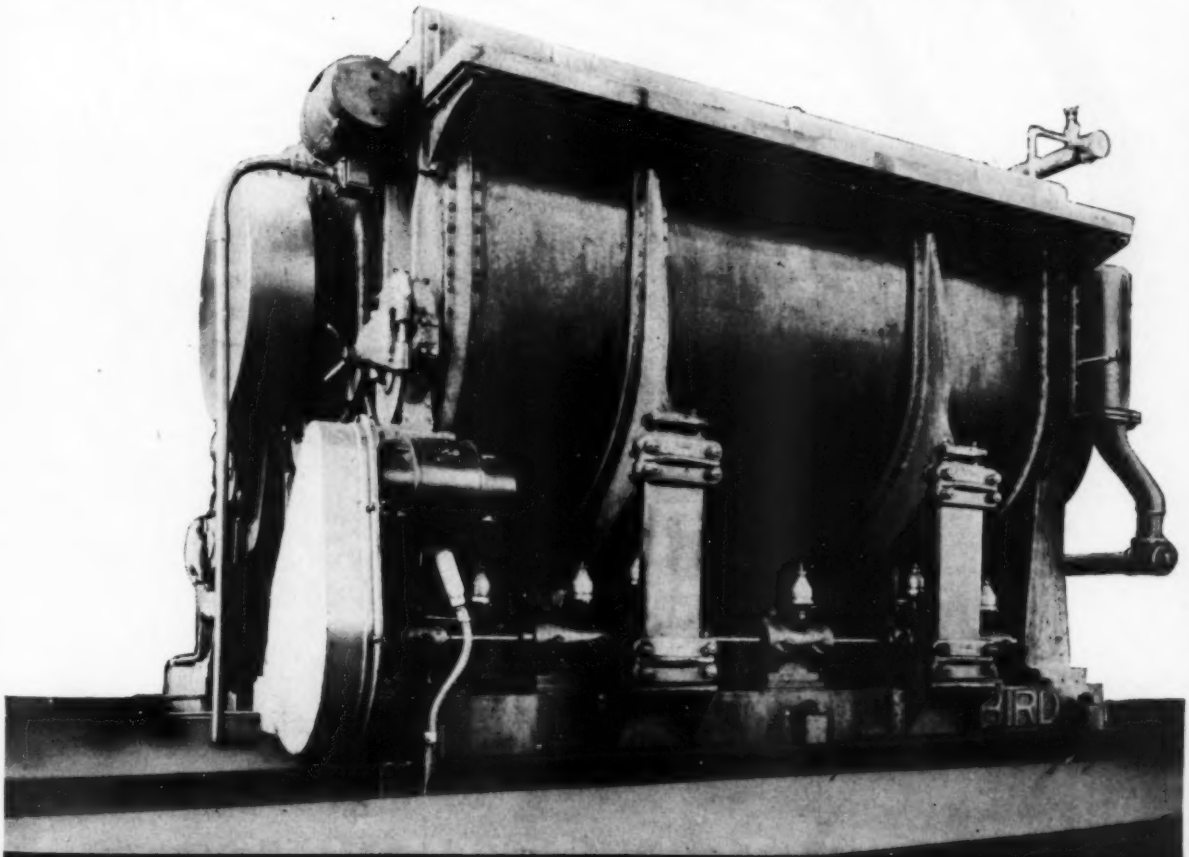

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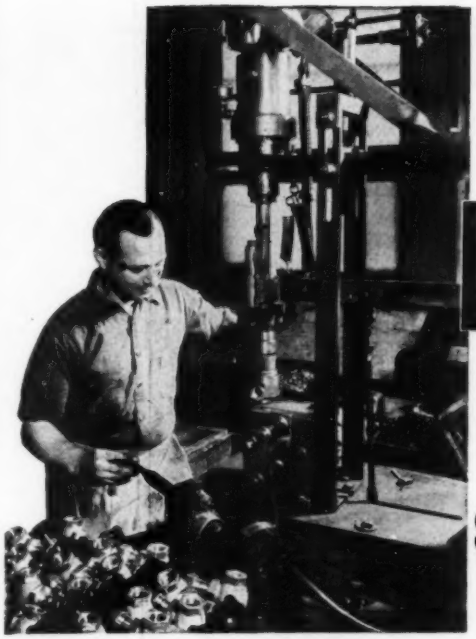

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• Assembling is greatly simplified by Lunkenheimer precision production... parts are so accurately made that special fitting isn't necessary.

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• You can't fool maintenance men on valve quality. They know that when a valve has a much longer than average service life, that valve has superior accuracy and precision built into it from handwheel to pipe threads. Such valves are the only kind that have ever been produced by Lunkenheimer. For over three quarters of a century, the Lunkenheimer quality ideal has won ever widening acceptance until today it is a recognized tradition in American industry.

Lunkenheimer quality is the balanced combination of many factors. Among them are finest raw materials approved by constant testing and research... sound, advanced design... highly skilled workmanship... absolute accuracy... perfect alignment of all parts.

As an inevitable result—wherever you find Lunkenheimer Valves you find maintenance cost records consistently lower.

Fig. 1430 Iron Body Gate

Fig. 2125 Bronze Double Disc Gate

Fig. 2228 Bronze Union Bonnet Gate Valve

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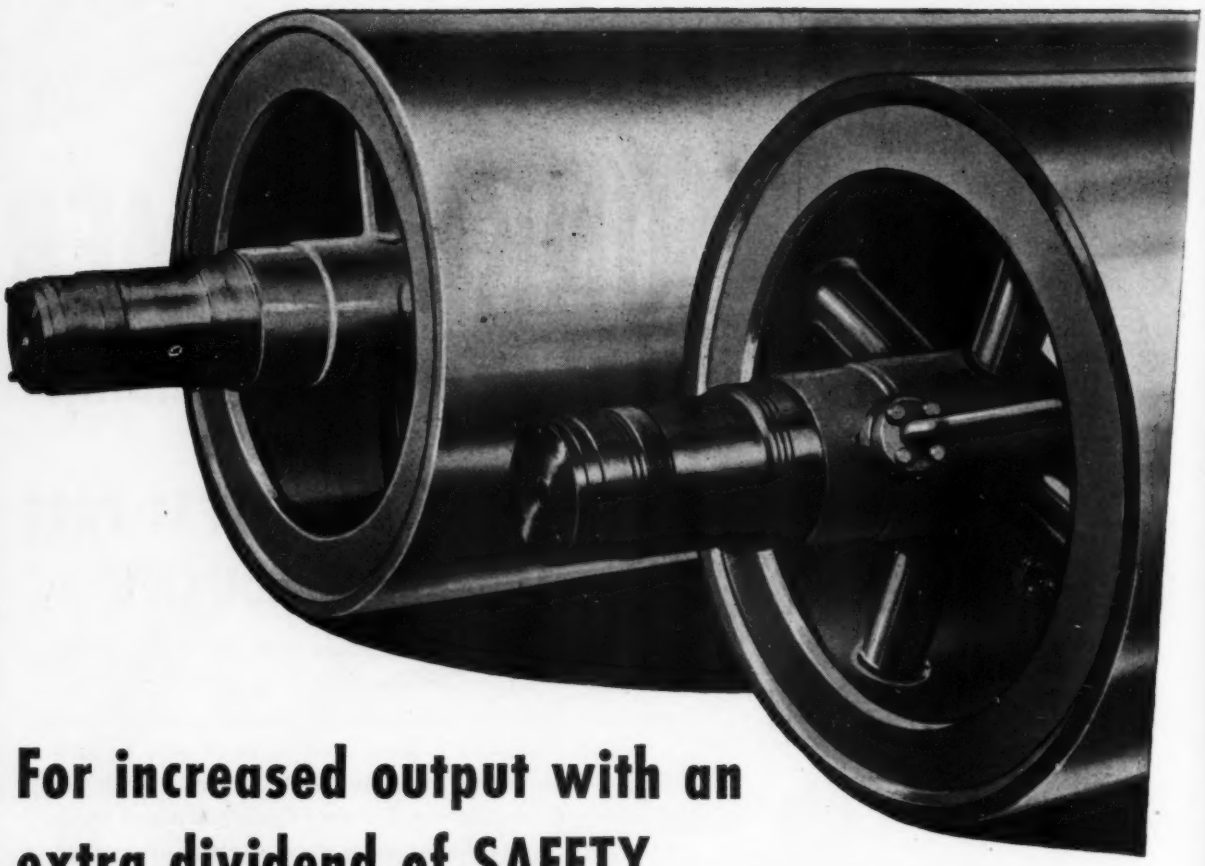

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You can get increased production from Lukenweld Jacketed Drier Rolls. In addition, you can be sure these steel plate rolls are *safe*.

In a large paper mill, Lukenweld Drier Rolls recently replaced several cast-iron rolls which had been destroyed by the explosion of another roll. Typical of a trend in the insurance field, the insurer of this paper manufacturer recognizes the safety of steel plate construction.

Numerous installations of Lukenweld Jacketed Drier Rolls have proved their safety while the drying rate has been stepped up 15 to 25 per cent with no increase in steam pressure. When steam pressures are increased, drying rates can be stepped up as much as 50%. High strength of rolled steel plate permits safe operation at pressure of 350 psi. and higher. Sizes from 2 ft. O.D. to over 18 ft. O.D. are offered.

Get the complete story about Lukenweld Jacketed Drier Rolls. Write for Bulletin 358. Lukenweld, Division of Lukens Steel Company, 408 Lukens Building, Coatesville, Pa.

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Do you know that this small unit is available on a rental basis, the rental to apply on a Hydrapulper of commercial size, if and when purchased; or, that this small unit may also be purchased outright?

The objective is to enable a mill to experiment to its heart's content, in a small way, and learn first-hand just how amazing a Hydrapulper really is before investing in one of regular size.

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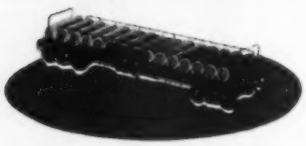

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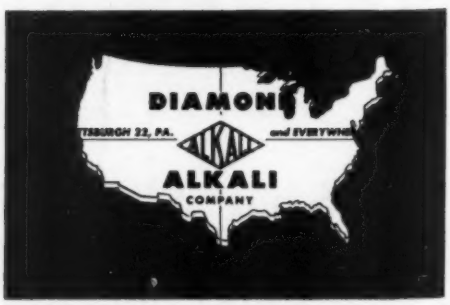

THE PAPER INDUSTRY
and PAPER WORLD
FEBRUARY 1948

◆

New Higher Court Decisions Affecting Paper and Paperboard

LEO T. PARKER
Attorney at Law

▶▶▶ DECISIONS RELATING to manufacturers and sellers of paper and paperboard have been rendered by the higher court during the past few weeks. We shall review these decisions in order to "prepare" readers to avoid similar law suits, and win unavoidable suits. Readers specially interested in any decision may identify it by the citation, and read the decision in any good library.

Sanitation Law

All modern courts consistently hold that the preservation of public health from danger resulting from the accumulation of sewage upon private property is as important as the preservation of life and limb of citizens. Hence, it is useless for any company to contest the validity of a law or order for sewage, particularly if a state law authorizes the improvement.

For illustration, in Fort Howard Paper Company v. Town of Ashwaubenon, 26 N. W. (2d) 661, it was shown that a state law authorizes municipalities to create sanitary improvements. A municipal board organized the Fox Sanitary District, and assessed private property including a large acreage owned by the Fort Howard Paper Company which filed suit to prevent the board from collecting assessments on its property. The higher court refused to interfere with the board's order, saying:

"Fixing the limits of the proposed district is within the discretion of the town board, which discretion the court has no power to review. . . . It is difficult to see how benefit to property due to the organization of a sanitary sewerage district to promote the public health and welfare can be apportioned other than on the basis of area or linear foot extent of the property. It is manifest from the proceedings in this case that the property of the plaintiff (Fort Howard Paper Company) will be benefited because the lands are within the watershed and may be served by the proposed improvement."

Hence, where a state law authorizes a public body, as a municipal board or commission, to organize, construct and maintain a sewer or water drainage project, the court will not interfere with a logical and sensible method of acquiring funds to finance the sanitary project.

Kills Fish

It is true that a company which pollutes water to the damage of a riparian owner may be liable. However, the complaining party must prove *actual* damages sustained, otherwise the court will allow no damages.

For example, in Masonite Corporation v. Steede, 21 So. (2d) 463, it was shown that a manufacturing plant on the banks of a river discharges daily from this plant into the stream a large amount of water containing wood fibre. One Steede owns lands on the river and operates a fishing resort equipped with all necessary fishing facilities. Steede sued the corporation owner of the plant for damages and alleged that the fibre killed practically all of the fish therein, "leaving only such few as managed to run up into lakes and branches"; because of which Steede's business of renting boats, fishing rights, etc. depreciated considerably. The higher court refused to hold the corporation liable, saying:

"The appellee (Steede) sues for loss of profits from this business. . . . In other words, damage to the appellee (Steede) because of the killing of the fish in 1943 does not appear with such reasonable certainty as to warrant a jury in acting thereon."

Double Compensation

All states have laws which allow double compensation to employees "wilfully" injured by employers. According to a recent higher court the "serious and wilful misconduct" which lays the foundation for double compensation "is much more than gross mere negligence, or even than gross or culpable negligence. It involves the intentional doing of something either with the knowledge that it is likely to result in serious injury or with a wanton and reckless disregard of its probable consequences."

For example, in Scaia's Case, 69 N. E. (2d) 567, the court was asked to decide whether two employees were entitled to double compensation on the ground that they were injured by wilful misconduct of a superintendent of the Deerfield Glassine Company.

The employees were injured while lifting a "dryer roll," which weighed about four tons, from a papermaking machine by means of chains attached at the ends of the roll. After the roll had been lifted and held suspended for about half an hour one of the chains gave way and permitted the

roll to fall back upon the machine, causing injuries to the two employees. Two types of chains were available for this work, described respectively as "tested" chains and "ordinary" chains. The chain that broke was an "ordinary chain," the welding of which gave way at the "grab link" or "ring." The injured employees contended that they were entitled to double compensation because the superintendent was "wilfully negligent" in using ordinary chain when the "tested" chain was available.

The higher court refused to allow double compensation, saying:

"Although stronger chain could have been used, there was no evidence that such chain would commonly be incapable of carrying the strain that was placed upon it, . . . In short, there was evidence that superintendent could have been more careful but we fail to find evidence that the risk he took was both so obvious and so great as to render his conduct 'serious and wilful.' "

No Witnesses

Generally speaking, an employee cannot recover compensation for an alleged injury if he fails to prove that he was actually injured within the scope of his employment.

For instance, in Dyer v. Brown Paper Mill Company, Inc., 28 So. (2d) 377, an employee sued the Brown Paper Mill Company for compensation under the State Workmen's Compensation Act. The employee alleged that he was hauling material in what is commonly called a "Georgia buggy," which carried a load of approximately five hundred pounds, and while attempting to move the buggy over rough surface "it suddenly jerked him and because of the weight of the load and the condition of the floor he was jerked with such force as to seriously and permanently injure his back."

Certain physicians refused testimony in favor of the employee and the higher court refused to award compensation, saying:

"We have found that there was no fracture or other injury to plaintiff's vertebrae or other bones. It is logical then to further find, as we do, that the pain and disability of which he complains, if it exists, results from pathology having no relation to or connected with the alleged accident. . . . There were no witnesses to it."

Valid Consideration

No contract is valid and enforceable unless based on valid consideration. According to a recent higher court a mere promise is valid consideration, *only* when based on a promise.

For illustration, in Brightwater Paper Company v. Monadnock Paper Mills, 68 F. Supp. 714, it was shown that under a contract a paper mill agreed to manufacture and sell to a paper company a type of paper required by one of the company's customers. The company agreed to order from the mill all such paper required by this customer.

In subsequent litigation, the higher court held valid the promise of the paper company to the paper mill that it would give to the mill all its business from the specified customers.

The court held that this promise was an inducement to the mill to agree to produce paper for the paper company and that the contract was valid because the promises of both the paper mill and the paper company were "valid consideration." This court said:

"There was adequate consideration and mutuality between the parties . . . The main and supplemental contracts with respect to this business were valid bilateral agreements."

Not Legal Agent

According to a recent higher court, an ordinary employee is not a "legal" agent for his employer, unless the testimony shows that the employer specially authorized such employee to act as his representative.

For illustration, in International Paper Company v. Aud, 196 S. W. (2d) 578, it was shown that one Hall was hired to check and mark the International Paper Company's timber. He had in the county a home in which he kept township plats used by him in making reports to the corporation. The corporation had not appointed Hall to act as its representative.

In subsequent litigation, the higher court held that Hall was not a legal employee authorized to represent the corporation. This court said:

"We conclude, therefore, that Hall was not an agent in charge of a branch office or other place of business of appellant (corporation) within the meaning of the statute."

Warehouse Employees

Employees in paper warehouses must be paid wages specified by the Fair Labor Standards Act, as follows: Employees who sort, pack, handle, or repair merchandise received in warehouse from interstate shipments. These employees may also perform *some* purely intrastate work, yet they must be paid minimum wages specified by the Fair Labor Standards Act. See Montgomery, 158 Fed. Rep. (2d) 948.

Pays Taxes Seven Years

According to a recent higher court, one who pays taxes for seven years on land in Arkansas is its legal owner, particularly if the land is unimproved and uninclosed.

For illustration, in Pattillo v. International Paper Company, 199 S. W. (2d) 307, reported March, 1947, it was shown that the International Paper Company paid taxes for seven years on wild, unimproved and uninclosed land. It claimed legal title to this land for reason of paying these taxes.

A prior owner contested the ownership in the corporation on the grounds that he had received his patent from the U. S. Government July 1, 1903.

The higher court held that the International Paper Company was legal owner of the land, saying:

"Where lands continue to be unimproved and uninclosed, and seven successive payments of taxes have been made, the possession 'continues and becomes complete unless the possession be broken by adverse entry or by commencement of an action before expiration of the seven-year period from the date of the first payment."

Same Privileges

According to a recent higher court, a foreign corporation legally domesticated in a state has exactly the same privileges as a local corporation.

For instance, in Mitchell v. Union Bag & Paper Corporation, 42 S. E. (2d) 137, it was shown that the Union Bag & Paper Corporation transacts business within the state of Georgia. It is a corporation organized under the laws of the state of New Jersey.

The corporation was duly domesticated in the state of Georgia with all the powers, privileges and immunities.

In subsequent litigation the higher court held that the corporation is subject to the jurisdiction of the courts within the state of Georgia wherein it had an agent, office and place of doing business, to the same extent as corporations originally organized and existing under the laws of the state of Georgia.

This higher court also held that a foreign corporation which has become "domesticated" in a state is a domestic corporation of the adopting state for all suit purposes in the state courts, but it remains a "citizen of the state" of its creation for purposes of jurisdiction, removal, and venue in the federal courts. Thus, where a foreign corporation has become fully domesticated by or under the laws of another state, it is not liable to attachment as a nonresident of such state, though,

of course, it is liable to attachment for any of those causes for which a domestic corporation would be liable to attachment.

Automobile Passing

If there is one rule of law that is well settled, it is the rule that when a driver of an automobile intends to cut to the left across a highway, he must make sure that he can cross with safety to himself and *all others* using the highway.

For illustration, in Harris v. Bigby Pulp Company, 29 So. (2d) 805, it was shown that one Harris, the driver of a passenger car, was seriously injured by the negligence of the driver hauling pulpwood in suddenly turning the pulpwood truck to the left and across the highway, while Harris was overtaking and passing. Although the lower court held the pulp company not liable, the higher court reversed the verdict, saying:

"The driver should have known it was not safe to cut out in front and attempt to cross the left side of the road."

Not Unfair

According to a recent higher court, a paper manufacturer will not be convicted of unfair practices toward labor, although he encouraged independent unions.

For illustration, in National Labor Relations Board v. Brown Company, 160 Fed. (2d) 449, it was shown that the Brown Company employs several thousand persons in the manufacture of wood pulp, paper, various paper products, and chemicals, a large proportion of which it ships in interstate commerce. The National Labor Relations Board sued the company to compel it to cease and desist from certain labor practices.

It was contended that the company was dominating and coercing its office employees in the formation and administration of an independent labor organization called the Brown Company Office Workers Association. It was argued that evidence that the company had permitted the independent union to organize at the company's plant on the company's time and with the aid of telephone and other special facilities was proof that the company was unfair.

The higher court refused to agree with these contentions, saying:

"There is no evidence that the respondent (company) or any of its supervisory officials had ever adopted a hostile attitude either toward unions in general or toward outside unions in particular."

Marked Wood

Considerable discussion has arisen from time to time over the legal question: Where pulpwood is "marked" by its owner or cutter, will the court favorably consider evidence of the owner or cutter that his marked wood was delivered to the purchaser? The answer is yes.

For instance, in McCully v. Bessey, 49 Atl. (2d) 230, the testimony showed facts, as follows: One Kent, by warranty deed, conveyed to one Dodge a three years right to cut the wood growing on a tract of land in Maine. Later Dodge arranged to sell some of the wood for the use of Keyes Fibre Company and payments were to be made as the work of cutting was done.

The outcome of subsequent litigation hinged on whether the court would accept as positive evidence that the wood delivered had "marks" thereon. This court held that testimony that "marked" wood was taken from the property was good and acceptable evidence.

Too Late

It is true that injured employees who sign final receipts for compensation payments are *not* barred from receiving additional compensation if the injury is aggravated or not fully disclosed in the first application. However, suits for additional compensation must be filed within the period specified by state laws, otherwise no additional compensation is allowable.

For instance, in Ketzel v. Hammermill Paper Company, 48 Atl. (2d) 89, the testimony showed facts, as follows: An employee of Hammermill Paper Company on September 9, 1938, suffered a "severe muscular strain of the back." He returned to work seventeen days later and three days later executed a final receipt for the compensation. Thereafter he was continuously employed, at his former wages, for four years and two months when he discovered that he was afflicted with the rupture of an intervertebral disc, a result of the accident. At this time, four years and eight months after he had executed the final receipt for compensation he filed and asked the court to grant further compensation.

In view of a state law which provides that this kind of suit must be filed within two years after execution of the final receipt, the higher court held that the suit was filed too late.

Majority Contracts

Generally speaking, in injury cases the higher court bases its decision on the testimony of a *majority* of witnesses.

In Bridges v. Brown Paper Mill Company, Inc., 28 So. (2d) 76, it was shown that an employee of the Brown Paper Mill Company was working at a drum which was running wood into a chip feeder. Sticks of pulpwood of various sizes and weights were carried from the wood yard by means of a conveyor chain to the drum. A stick of wood became disengaged from the conveyor chain at a point several feet above the drum and fell or was thrown from the conveyor, and struck the employee in the face with such force as to knock him against the wall of the room in which he was working. In later litigation, a nurse employed by the Brown Paper Mill Company, who proved that she examined the employee, testified that she observed no blood from the ears or nose; found him normal in his reactions and in his responses to her questions; and concluded that he was not seriously injured. Other witnesses testified that the employee was dazed by blows he received; that he began to bleed from the mouth, nose and ears, and that it was necessary for him to be assisted while awaiting medical attention. Also, four physicians testified on behalf of the employee expressing the opinion that the employee had suffered a basal skull fracture with consequent injury to the brain and brain tissues which rendered him totally and permanently disabled to continue the performance of manual labor.

The lower court refused to allow compensation, under the State Workmen's Compensation Act, for permanent disability, but the higher court reversed the verdict.

Also, see Lewis v. Southern Advance Bag & Paper Company, Inc., 28 So. (2d) 68, where the higher court held that conflicting medical testimony supported the finding that the development of a left inguinal hernia followed a successful operation on an employee for a right inguinal hernia which was occasioned by an accidental injury in the course of his employment.

Sleeping Employee Killed

According to a recent higher court, a sleeping employee is acting within the scope of his employment and entitled to compensation under the State Workmen's Compensation Act for an injury.

For example, in Fields v. Brown Paper Mill Company, 28 So. (2d) 755, it was shown that one Fields was employed by the Brown Paper Mill Company as a laborer. Large quantities of pulpwood are shipped to the mill by rail in flat cars, which are unloaded by a drag line.

A short time before Fields was injured, the cars that had been spotted on the tracks were unloaded and the foreman told the employees that he

(Turn to page 1603)

A Review of the Literature on Sizing-Part II

EDWIN SUTERMEISTER

▶▶▶ DIFFERENT RESULTS ARE obtained with different fibers—probably anyone who has had occasion to do any research work on sizing has noticed that by properly treating fibers consideration alterations in their sizing characteristics may be produced. For example, sizing of high alpha pulp is usually quite difficult and unsatisfactory, but if the fibers are given a light, preliminary treatment with bleach, very much better sizing can be obtained.

Fibers

A half dozen papers since 1933 have called attention to the influence of fibers on sizing, but no very comprehensive study apparently has been attempted. There are, however, several which indicate good lines of thought in attacking this phase of the problem, and it seems highly probable that more such work would aid materially in cleaning up some of the mysteries and inconsistencies which becloud so many investigations.

Ecke (*Papierfabr.* 31, Tech.-wiss. Teil 667, 1933) considers the most important single factor in sizing to be the nature of the pulp, which depends on the kind of wood and the cooking treatment. Ease of sizing parallels the pentosan content of the pulp.

Bialkowsky (*Paper Trade J.*, Sept. 8, 1933) states that fibers which reduce the alkalinity of dilute caustic soda solutions have a similar action on sodium resinate solutions and thus cause the liberation of free abietic acid in amount depending on the nature of the fiber. The difficulty in sizing pulps seems to follow their lower tendency to remove alkali from solution.

H. Boedeker (*Finnish Paper & Timber J.*, Dec. 15, 1935) believes that kraft fibers are easier to size because of the alkaline liquors used in cooking. Uncolored papers are sized best at a *p*H of about 5.5; if colored by sap brown this should be lowered to about 4.5.

S. J. Robinson (*Paper Trade J.*, Aug. 13, 1936) states that in the absence of fibers the reaction of sodium abietate with excess aluminum sulphate gives neutral aluminum abietate, but if fibers are present free rosin accompanies the aluminum abietate. This is due to selective adsorption by the fibers, and different pulps act differently in this respect. He found the relative ease of sizing of pulps differed according to the method of testing for sizing.

S. Samuelsen (*Papir J.*, Aug. 20, 31, 1938) found that sulphate pulp was much easier to size than sulphite, only half the amount of rosin being needed for identical results.

W. S. Wilson and H. E. Duston (*Paper Trade J.*, Nov. 18, 1943) discuss the reaction of fibers and rosin in the light of base exchange, and the function of alum in bonding rosin to fibers. Mention is made of differences in the "available bonds" on different fibers and their effect on sizing. In a second paper W. S. Wilson (*Paper Trade J.*, July 6, 1944) proposes a method for determining the number of bonds on any given pulp.

H. F. Launer (*Paper Trade J.*, March 7, 1940) finds that the retention of alumina by fibers is much larger than that calculated from the concentrations involved in papermaking. Fibers raise the *p*H of alum solutions in amounts characteristic of the type of fiber. H ion is strongly retained by fibers and its amount is unchanged by heating and cooling. He ascribes the decrease in *p*H, observed when paper and water are heated and cooled, to increased hydrolysis of the aluminum salts in the paper.

Water

The data presented in the few papers on water in its relation to sizing are somewhat unsatisfactory. Two appear to be directly contradictory, while the abstracts of several others are too vague to convey any definite meaning. There are, however, two or three papers which seem to get down to fundamentals, and which are worth careful study.

Considering the tremendous amount of water used per ton of paper it is obvious that its effect on sizing might be considerable, but the difficulties in determining what these effects are, confused as they are with so many variables, are almost insurmountable.

R. Lorenz (*Papierfabr.* 30 No. 50, 722-25, 1932) takes up the influence of hardness of water, carbon dioxide content, *p*H value and buffer action, and also mentions the influence of back water, stating that in some cases it should be neutralized and in others corrected with sulphuric acid.

Ecke (*Papierfabr.* 31 Tech-wiss. Teil 667, 1933) finds that salts present in the water are not as deleterious as supposed, and that sizing was improved when white water was used in the beater. W. Brecht (*Ibid.* pp. 149-167) discusses the fresh water requirements and the re-use of white water.

P. Hermann (*Wochbl. Papierfabr.*, Jan. 30, 1937) in a discussion of sizing troubles and process water, claims that sudden difficulties in sizing are often due to variability of the water supply rather than to the size used. He calls attention to variations in water caused by weather conditions, and recommends checking the mill water when sizing troubles occur. He gives analyses to show the drastic changes which may take place, and mentions means of overcoming troubles.

S. Samuelsen (*Papir J.*, Aug. 20, 31, 1938) studied the influence of eight different waters of widely varying competition on the sizing of bleached sulphite with 1.5 per cent Delthirna size and 2.25 per cent alum. The poorest sizing was distilled water and ice water with both Delthirna and Bewoid sizes. Freezing and remelting ordinary water, but not distilled water, hurt its sizing effect. Ice water was added at various stages and found to have an influence, even after

the size was fixed on the fibers. The change in the effect on sizing is apparently not caused by inorganic compounds, but is due to the rearrangement of certain organic compounds whose characteristics are not known. Influence of the degree of hardness of the water was slight; Bewoid size was not affected at all. When sulphate waste liquor, or bleach waste liquor from sulphate pulp is added to ice water, the sizing effect is considerably improved.

E. L. Keller, F. A. Simmonds and P. K. Baird (*Paper Trade J.*, Jan. 2, 1941) found that alum floc precipitated by the action of hard water had an injurious effect on the strength of the paper. Lowering the *p*H to the same point by acid had a negligible effect on strength.

The paper by L. B. Miller (*Paper Trade J.*, Feb. 20, 1941) on floc forming chemicals also has information of value in a study of water conditions for if floc must be formed it is the concentration of the floc forming chemicals with respect to the water, its *p*H, etc., which determines their proper formation. (See *Paper Trade J.*, Jan. 12, 1939, for another similar paper by the same author.)

W. P. Dohne and C. E. Libby (*Paper Trade J.*, Nov. 27, 1941) found that good sizing could be obtained at *p*H 8.0, but only if recirculated white water was excluded.

Alum, Alum Substitutes and Acidity

Studies of alum and its substitutes seem to have been on a rather more scientific basis during this period. Prior to 1932 the experiments were of an empirical nature and were directed toward determining the best ratios of size and alum, or toward the use of other materials to replace alum completely, or to a very great extent. More recently efforts have been directed more toward finding how and why alum functions, and in the case of substitutes to modify the action of alum by addition of sodium aluminate or sulphuric acid, rather than to use these as full substitutes. This change in the approach to this problem seems to indicate that sizing is receiving the benefits of the advancing theories in chemistry. More than any other thing it is probably due to the development and use of the *p*H meter with the glass electrode.

A. Monestier (Fr. pat. 708674, April 3, 1930) prepares a size precipitant by mixing clay, kaolin or other aluminous material with water at 90 deg. C. and then adds 60 deg. Bé. sulphuric acid.

According to F. J. Curtis (U. S. pat. 1885185, Nov. 1, 1932) fibers and sizes are beaten and alum is added to precipitate the size with the production of colloidal alumina and sulphuric acid in a fixed ratio. This ratio is controlled by the addition of sodium aluminate.

C. E. Libby (U. S. pat. 1929205, Oct. 3, 1933) treats fibers in suspension with rosin size and soluble alkali aluminate, and then precipitates with alum. The effect of the aluminate is to neutralize the white water used in the furnish of the beater, and cause more complete precipitation and retention of the rosin, thus improving the sizing.

J. J. Healy, Jr., and C. P. Dyer (*Paper Trade J.*, March 23, 1933) describe a process of sizing in which both alum and sodium aluminate are used. This gives flexibility in the proportion of alumina, and the *p*H of sizing, and is said to enable good sizing to be obtained at a *p*H as high as 7.0.

P. V. Shumilov (*C. A.* 28, 5981) found that alum solutions prepared from nephelite tailings and containing 0.4-2.2 per cent phosphoric anhydride per kilo of fiber showed no injurious effect on sizing or the strength of the paper.

A. W. Thomas (*Paper Trade J.*, Feb. 28, 1935) discusses solutions of basic salts of aluminum and explains their peculiarities according to the "olation" theory of Werner and Pfeiffer.

A. M. Lloysis (Fr. pat. 811264, April 10, 1937) sizes paper with aluminum resinate produced by the reaction between aqueous aluminum sulphate and alkali resinate in the presence of aluminum hydroxide.

In discussing the relation of cellulose to aluminum compounds Y. G. Khinchin (*Bum Prom.* 15, No. 9, 15-23, 1937) states that alumina is chiefly adsorbed by double decomposition of aluminum sulphate and impurities in the fibers. This proceeds at about *p*H 4.5-5.0; it is retarded at lower *p*H and inhibited at higher values. A small amount of alumina is directly adsorbed from aluminum sulphate, but the rate of such adsorption decreases with decreasing *p*H. The rate is also influenced by fiber swelling, which, in turn, is influenced by pentosan content.

J. A. DeCew (U. S. pat. 2138840, Dec. 6, 1938) prepared a true solution of aluminum sulphate at a *p*H of 3.8-4.2 by adding to an aqueous solution of commercial aluminum sulphate an aqueous solution of lime, magnesia, or soda, or their carbonates or acetates.

L. B. Miller (*Paper Trade J.*, Jan. 12, 1939) discusses some of the less well known aspects of the fundamental chemistry of alum, especially in dilute solutions. As necessary for floc formation he mentions (1) presence of at least a minimum quantity of aluminum ions! (2) presence of negative ions of strong coagulating power; and (3) proper adjustment of *p*H. Mechanical action and time are also strongly influential. Floc is a basic compound of the Werner type. He also discusses the use of alum with aluminate and activates silica, and for pigment retention, clarification of water and rosin sizing. In a later paper (*Paper Trade J.*, Feb. 20, 1941) the same author gives a good discussion of conditions affecting floc formation. The ideas presented should be of value in studying sizing and the strength properties of paper. The complicated nature of the problem is pointed out.

W. P. Dohne and C. E. Libby (*Paper Trade J.*, Nov. 27, 1941) carried out work on unfilled papers and high alpha pulp, with alum and sodium aluminate as precipitants for a 100 per cent and a 10 per cent free rosin size. Good sizing could be obtained at *p*H 8.0, but not if recirculated white water was used. Under such conditions a *p*H of 6.0 was about the maximum. For best sizing, the ratio of aluminate to alum must be carefully adjusted to the type of size, the white water, and the *p*H.

T. T. Collins Jr., H. L. Davis and B. W. Rowland (*Paper Trade J.*, Sept. 25, 1941) survey the behavior of alumina, aluminum salts and rosin size in relation to sizing. They show zones of complete precipitation at various *p*H values. Since the work was done in the absence of fibers the conclusions relating to sizing are wholly theoretical.

B. W. Rowland and J. J. Harrison (*Paper Trade J.*, Nov. 16, 1944) studied the alumina content of rosin-free hand sheets in relation to tub sizing. They found that aluminum oxide sols added to pulp impart water resistance, but if the sols contain even slight amounts of sulphate ions they are without effect on water resistance. Aluminum sulphate causes a decrease in the bursting and folding strength of the sheets when amounts over 3 or 4 per cent are added. The same amount of aluminum as an oxide sol does not reduce the strength. The more alumina sol used, the greater is the sizing effect.

J. C. Redd (*Paper Trade J.*, Aug. 17, 1944) reports on the role of alumina in the mechanism of rosin sizing. The variables affecting the precipitation of alumina are mentioned and studies of their effect on sizing are given. Freshly precipitated alumina becomes unpeptizable on heating or aging, and if sulphate ions are present peptization is difficulty or impossible.

Unpeptized alumina in large enough amounts, will effect sizing of paper with rosin, but not as efficiently as alum. Sizing with rosin may be accomplished by colloidal alumina, and since acid is absent, strength is not injured, sulphates in ordinary use prevent the formation of colloidal alumina. W. S. Wilson (*Paper Trade J.*, Aug. 23, 1945) claims that the presence of sulphate or similar anions in the beater is bad for sizing against writing ink with rosin and alum. If the stock is alkaline large amounts of alum are needed, and the higher the sulphate content the lower the *p*H must be for optimum sizing. If excess alkali is avoided and sulphate content kept at a minimum, a highly basic alum will give as good sizing at *p*H 6-7, as can be obtained under ordinary conditions at *p*H 4.0. Such alum is not commercially available, but considerable can be gained by using sodium aluminate.

Acidity

R. H. Rasch, M. B. Shaw and G. W. Bicking (*Bureau of Standards J. Research* 11 7-23, 1933) studied the effect of beating and sizing on forty-three bond papers and found that careful adjustment of the *p*H of rosin sized papers improved their accelerated aging test. A *p*H of 5.0 appeared to be about the best. The effect of surface sizing on the strength factors of the papers was also noted.

H. Ellern-Eichmann (*Papierfabr. Tech. wiss Teil* 197, 209, 226, 1933) states that the injurious effect of alum can be largely avoided if the rosin is well beaten into the fibers. The loss of strength due to alum can be more than compensated by the use of 3-5 per cent of glue size.

M. B. Shaw, G. W. Bicking and M. J. O'Leary (*Paper Trade J.*, Nov. 14, 1935) found that high acidity from the use of an excess of alum in rosin sizing caused a marked decrease in the stability of the papers. It was again concluded that it was unsafe for the *p*H to go below 5.0.

Ecke (*Papierfabr.* 31 Tech-wiss-Teil 667, 1933) states that the effect of *p*H seems to be mainly on the sintering point of the floc; at the optimum the sintering point is below the drier temperature, but floc size is not yet large enough to destroy sizing effect.

D. Price and D. D. Cameron (*Paper Trade J.*, Dec. 19, 1946) have made a study of the effects of sulphuric acid in adjusting the *p*H of the water used, and also of that of the pulp. In the precipitation of size in the stock a certain amount of acid as a substitute for part of the alum was found beneficial to different degrees with different pulps. Papers in which it was used were better sized and had greater strength.

Analysis and Testing of Sizes

During the last fifteen years relatively little attention has been given to methods for the analysis of sizes, but what few papers have appeared have been along the lines of titration procedures. It is not known whether the other extraction method has been generally abandoned because of the error which is supposed to be introduced by the hydrolysis of the sodium resinate, but in view of the statements of Bialkowsky it seems that such hydrolysis may be far less than has been supposed.

R. B. Porter and W. M. Thomas (*Paper Trade J.*, June 20, 1940) discuss the analysis of rosin-wax sizes. Total solids are determined by drying as usual. Free rosin is titrated by alkali directly in an alcoholic solution of the size. Total rosin is precipitated with hydrochloric or sulphuric acid, filtered, washed free of acid, dissolved in alcohol and titrated. Wax is determined by difference.

E. A. Georgi (*Paper Trade J.*, Aug. 15, 1940) also titrates free rosin, but uses thymol blue as an indicator and obtains the end point by noting the intensity of light which passes through a Wrattan No. 52 filter and then through the solution being titrated. For the determination of free alkali, isopropyl alcohol is superior to ethyl alcohol, as it permits less combination of the free alkali and the free rosin. Neither gives entirely satisfactory results unless the size contains practically no water.

W. E. Shaefer and A. C. Dreshfield (*Paper Trade J.*, Nov. 14, 1940) describe a method for determining paraffin wax in sizing products. This depends on the high solubility of wax in hot acetic anhydride and its slight solubility when cold. The method is said to be rapid, good for routine use and accurate in its results. It is better for rosin-wax sizes than for wax emulsions alone. The same authors (*Paper Trade J.*, June 8, 1944) report on a modification of the extraction mixture to make it more applicable for analyzing dry sizes.

Sizing Tests and Rosin Determinations

It would seem that some of the confusion regarding different methods of testing papers for sizing is disappearing, and that many of the older methods must have been practically abandoned—at least they are not mentioned in any of the papers published in the last fifteen years. The majority of the recent papers relate to the rate of penetration of water, but the end point is determined in many different ways. Perhaps this variety of end points is desirable, but it is suspected that many will pass out of the picture soon, and only those will remain which have a direct bearing on the use to which the paper is to be put.

For papers which are to be used for writing, in which feathering of the pen marks is far more important than complete penetration of the sheet, there are several papers showing attempts to standardize this heretofore rather unsatisfactory test.

Comparatively little attention has been given to methods of determining rosin in papers. This subject has apparently reached a relatively stable condition.

F. V. Mon (*Papeterie Belge*, 12 621, Oct. 1932) determined the degree of sizing by noting the time required to break a strip of paper under a given load, when it is suddenly immersed in water at a definite temperature. A very similar test is described by H. Sadler (*Papierfabr.* 30 553, 1932). These tests are affected by the thickness and weight of the paper, the degree of beating of the fibers, the composition of the paper and the temperature of the water.

R. M. Cobb and D. V. Lowe (*Paper Trade J.*, March 22, 1934) describe a method for testing the sizing of boards in which the sample is clamped against a ring, which is then filled with the test liquid. After a definite time the liquid is poured off, that remaining on the surface wiped off with a cloth, and the gain in weight of the board determined. The method can be used to compare boards of different caliper, but cannot be readily applied to thin papers which soak through in less than 15 seconds. It is also useful in studying the sizing at different depths in the board. P. W. Codwise (*Paper Trade J.*, Jan. 16, 1936) reports on co-operative work by the Cobb method in six laboratories. It was concluded that the amount of water absorbed varied directly as the square root of the test time.

P. W. Codwise (*Paper Trade J.*, March 8, 1934) measures the resistance to water penetration of paperboard by an adaptation of the dry indicator method. The board is fastened to the lower end of a glass cylinder by wax, placed on a clear glass plate which has previously been sprinkled with the dry indicator, and water at 70 Fahr. is poured in while starting a stop watch. The cylinder is held down on the plate by a 2-lb. weight, and a mirror below the plate enables the indicator to be observed continuously. The end point is considered to be when a clear, distinct, circular

area is colored by the dye. In another paper (*Paper Trade J.*, March 4, 1943) the same author describes tests for the resistance to penetration of paper and paperboard to water at temperatures as high at 212 Fahr. The test specimen is made into a tray and gently placed on the bath of testing water. The end point is considered to be when 90 per cent of the area has wet through and turned dark in color.

F. T. Carson (*Paper Trade J.*, May 24, 1934) discusses the dry indicator method of testing, and describes apparatus and methods for applying it to all types of paper and fiber boards. The results have been incorporated in TAPPI standard method T 433m-44.

Surface wetting as a measure of sizing has been discussed by I. I. Kovaleskii in three papers. In the first (*Bum. Prom.* 13 21, 33, 1934) he treats the relation between sizing, the laws of capillarity and the angle of wettability, and proposes a method for testing the surface properties of paper by selective wettability. Improved sizing is indicated by increased wettability by benzol or any other non-polar liquid in the system paper-hydrocarbon-water. In the second paper (*Ibid*, 15 9, 1936) he describes a method for measuring the critical angle of wettability on the boundary line of the system by an apparatus called an "ardeometer." In the third paper (*Ibid*, 15 48, 63, 1936) he applied this method to hand made sheets of various fibers. The wettability of mechanical wood pulp was lowest, and that of wool was higher than any of the vegetable fibers. Good sizing was obtained with white size at lower temperatures than with fully saponified size. Selective wettability was greater on the wire side, and calendaring was injurious to sizing.

The Currier size tester is described by F. D. Broadbent, C. Brown and H. A. Harrison (*Paper Trade J.*, Nov. 5, 1936). This is a device for wetting the paper on one side and keeping it wet until enough water has penetrated to enable an electric circuit to be completed. The end point is indicated on a meter. This instrument is said to give lower results than the dry indicator method, and the ratio between the two varied from 1.2 to 3.58 in nineteen papers which were tested.

The "News Penetration Tester" for determining sizing is described by J. Hammond (*Paper Trade J.*, Nov. 19, 1936). This instrument was designed to employ as the penetrating medium the same type of ink used in printing, either water or oil vehicle. Its operation is based on the change in reflectance of the surface of the sheet as the medium passes through it from the under side. Since observations are made photoelectrically the personal equation is eliminated.

H. N. Lee (*Paper Trade J.*, Dec. 31, 1936) gives a series of illustrations, apparently drawings, which he claims show the appearance of rosin precipitated on the fibers in papermaking operations. No hint of the methods of staining or observing is given.

S. J. Robinson (*Paper Trade J.*, Aug. 13, 1936) states that paper which has been air dried, or dried at low temperature, yields its total rosin to a dry, neutral solvent, such as chloroform. The temperatures of the dryer section are sufficient to decompose at least part of the aluminum resinate, and the basic aluminum resinates which are probably formed are insoluble in chloroform.

The quantitative determination of rosin in paper is discussed by H. F. Launer (*J. Research Bureau of Standards* 18 227, 1937) and the details of a method are given. This takes into account and corrects an error in the extraction by the former TAPPI method pointed out in an earlier paper by E. Sutermeister and W. V. Torrey (*Paper Trade J.*, Jan. 21, 1932).

J. A. Van den Akker, P. Nolan, A. C. Dreshfield and H. F. Heller (*Paper Trade J.*, Nov. 23, 1939) measure the time for the transudation of water by means of fluorescent indicator, the fluorescence being recorded photoelectrically. Water vapor surrounding the sample does not cause an appreciable error.

G. H. Lafontaine (*Paper Trade J.*, Aug. 7, 1941) describes a method and apparatus for measuring the angle of contact of liquids on paper surfaces. He considers this test best suited for surface wettability, but it can also be used to measure partial penetration by measuring the angle at different times.

W. Bracht and E. Liebert (*Papierfabr.-Wochbl. Papierfabr.* 1943 289) report on a comprehensive study of writing on paper with ink, including the effect of various types of sizing, the degree of sizing and the composition of a variety of papers on the bleeding of inks, and also of the penetration of different kinds of ink.

According to B. W. Smith (*Paper Trade J.*, Feb. 22, 1945) if feathering is the main consideration, a modified pen and ink test is excellent. He employs three different colored inks, each with three or more different amounts of materials causing feathering (Trisodium phosphate, phenol and diethylene glycol). For comparison the TAPPI standard ink is used. In general, if no feathering takes place with any which contain 0.5 per cent of the reagent, the paper will be universally satisfactory.

W. S. Wilson (*Paper Trade J.*, Dec. 12, 1946) studied the mechanism of water and ink penetration through a sheet of paper. He states that water penetration depends largely on the type of pulp and the amount of size, while sizing against ink is a function of the right type of aluminum present and its ability to coagulate the dye in the ink.

M. O. Shur and R. M. Levy (*Paper Trade J.*, March 21, 1946) describe an instrument for making standard ink lines on paper, and discuss its use in studying the effectiveness of sizing of writing paper. A standard ink is described and brief mention made of some of the factors affecting spread of commercial inks.

(*) This is a three-part article. Part I appeared in the January (1948) issue of this magazine. Part III will be published in a subsequent issue.

New Higher Court Decisions Affecting Paper and Paperboard

(Continued from page 1599)

was going to get the locomotive to come down and pull out the empty cars. It must have been some fifteen to thirty minutes before the locomotive came to pull the empty cars out. When the locomotive started pulling the cars out, Fields commenced screaming. When the train was stopped, he fell beside the track between one of the conveyor troughs and the track from which the cars were being pulled. One of his legs was mashed and the other broken. He was carried to a hospital and died shortly thereafter. The testimony showed that Fields had fallen asleep under the cars just before the accident. It was contended that Fields had gone to sleep under the railroad car, which he had been warned not to do, and that, therefore, he was not engaged about his employer's business when the accident happened. Nevertheless, the higher court awarded compensation under the State Workmen's Compensation Act, and said:

"It is admitted as it must be that the accident occurred in the course of decedent's (Field's) employment. . . . He could have been asleep where his presence was required. . . . The deceased, though not actually working at the time, was being paid for this time. . . . His employment reasonably required him to be at the place where he was injured."

Wooded hills form a picturesque background for the plant of Pacific Mills Limited, Ocean Falls, British Columbia

How Pacific Mills Limited Keeps Employees Contented

W. J. GRANBERG

▶▶▶ ON A MOUNTAINSIDE 325 miles northwest of Vancouver, British Columbia, is Ocean Falls, a planned community. The town must be reached by sea or air—no railroad or highway touches it.

This picturesque village is owned and operated by Pacific Mills Limited, the most northerly located pulp and paper mill on the North American continent. The growth of this community dates from 1915 when Pacific Mills, aided by American capital, was organized to take over a firm which had started a small pulp and sawmill operation at Ocean Falls early in the 1900s. The company immediately expanded and began to manufacture newsprint. At that time, there were some fifteen small homes in the town, plus old-time bunkhouses for unmarried workers in woods and mill.

The company's first manager at Ocean Falls was Archie B. Martin, ex-railroad construction worker and sawmill operator from the States. He believed that the successful operation of the plant could be assured only by keeping the employees satisfied, and by providing good homes amid surroundings that would contribute to the welfare and happiness of the workers' families. Mr. Martin was president of the company from 1918 until 1944 when he became chairman of the board. He passed away in 1945, two years after he had launched a community development program which was the fruition of his philosophy that Ocean Falls should be a community of fine homes.

The work begun by Mr. Martin is being carried on by Paul E. Cooper, who succeeded him as president of the company. The building of such a town requires certain imagination, coupled with the realization that a contented man is a good workman; the knowledge that aside from the utilitarian value of a good employee, there is the humanitarian viewpoint that a workman's home should be comfortable for him and his family.

The extent of the operation of Pacific Mills makes contented workmen a necessity. The total production of the plant amounts to 140,000 tons of paper annually, which includes 80,000 tons of newsprint. The remainder of the output includes kraft paper, tissues, and specialties. Groundwood, sulphite and sulphate pulps are produced in the pulp mill. The company also produces a small amount of machine-dried pulp.

Hydroelectric power is provided by seven generating units at a concrete dam 677 feet long and 75 feet high, which gives an operating head of 145 feet. The impounding waters of two lakes situated immediately beyond the townsite feed the dam.

Expansion plans of the company have spurred search for additional waterpower sources, and the Nascall Basin just northeast of Ocean Falls is being considered as site for an initial 15,000-hp. installation on the Nascall River. The cost of this project would range between $3,000,000 and $4,000,000.

When a company has an investment of $38,000,000 in the isolated woods section, along with an annual payroll of over three million dollars, it is only natural for that company to protect its investment. Pacific Mills has approached the problem of maintaining an efficient plant personnel by creating a company-owned town which offers modern housing, together with all of the niceties of good living.

Of the 1400 employees at Ocean Falls, 630 are married men with families, 680 are single men, and 90 are single women. Well-appointed dormitories and apartments house the women who are not accommodated in the hotel. Practically enough, the town is calculated to best serve the family man with wife and children. For him there are four hundred individual dwellings, six large and new apartment houses, and fifty duplex residences.

The apartments are heated from the central steam plant and each has its own laundry and drying room. The individual residences have electric ranges and refrigeration, modern plumbing. Some are heated from the central system, while others have their own heating plants burning wood, coal, or oil. The duplex houses are for two families, with each having a five- or six-room apartment occupying two floors. And these are as modern as the residences.

Since a modern town requires more than just good housing, there is a theater at Ocean Falls which seats 500 persons; a bank keeps hours best suited to workmen, and a laundry employing twenty women does commercial work

at current rates. The hospital, with its modern operating room and x-ray equipment, has twenty-eight beds and eight bassinettes. It is staffed by two doctors and eight nurses.

The spiritual side of the town's life is cared for by three churches, while the intellectual aspect is not forgotten in a library of more than 5,000 volumes which is administered by a committee of the townspeople. Education receives a great deal of attention in two large buildings which accommodate 350 pupils in fifteen classrooms. Thirteen teachers, plus supervisor, are paid wages higher than the current scale to keep scholarship of town's students at a high level. Evening classes for adults offer courses in home economics, industrial arts and trades, and business studies. As with the library, an elected board administers the schools, hiring the teachers, and seeing to it that no pupil misses the annual, free medical inspection, for the good health of its residents is one of the boasts of Ocean Falls.

Social service has not been forgotten by the company. By payroll deductions which are matched by Pacific Mills, retirement income pensions are paid those who quit work at 65. Although the amount depends upon an employee's salary and his term of service, a pension of approximately $100 a month can be earned under current contributions. Group insurance is also available and it provides death, accident and sick benefits, based on weekly earnings. Hospital and medical care is provided through a payroll deduction plan to which an employee is expected to subscribe after three months of service.

This block of attractive homes is typical of the residences in Ocean Falls; there is none of the drab monotony of a company town

Since Ocean Falls does not offer the attractions and diversions of a city, the providing of adequate recreational facilities is good business. A full-time director, paid by the company, directs a program of sports which includes basketball, badminton, archery, swimming, and boating. In addition, tennis, bowling and skiing are popular. One family in four owns its own boat, usually a trim cruiser the man of the family built himself, and the Ocean Falls Yacht Club cuts a fine figure on regatta day. Perhaps the most popular all-family sport is swimming, and in a heated indoor pool.

Although the company-operated store is a "general" store, it is limiting it greatly to call it so, for the three-story structure is as complete in its stock as a large department store. And it serves the townspeople "from the cradle to the grave," and at prices which for the most part are on a level with those in Vancouver.

A milestone in the housing program was passed last summer when the million-dollar Martin Inn was opened, named after the man who founded the community at Ocean Falls. This six-story, fireproof structure is the fourth largest hotel in British Columbia. It offers all of the comforts of any modern hostelry. With accommodations for about 350, this hotel was built expressly for single employees of the company, and it also will serve as a social center for the community.

The town has no traffic problem, for the delivery trucks of the store are the only vehicles and their leisurely going and coming offers no hazard to children playing in the streets. And the streets are something! Like everything else in Ocean Falls, they are of wood — two-by-fours or three-by fours, placed on edge, to provide a solid thoroughfare in this town perched on the side of a hill where many of the homes are reached by steps.

And there you have Ocean Falls, a pulp and paper town of good living and hard work. It is not an Utopian community for isolation does have its drawbacks, but efficient operations are maintained, with labor turnover no higher than in a large city, through effective administering of the needs of a community of men, women and children.

There are fifty of these modern duplex residences in Ocean Falls; they accommodate two families

The Lignin-Alcohol Condensation—

The Reaction of Lignin with Amino- and Nitro-Butanol

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▶▶▶ IT IS WIDELY accepted that alcohols condense with lignin to form soluble condensation products. In a recent review (*7*), Phillips stated: "In place of ethanol, other alcohols such as methanol, butyl and amyl alcohols, benzyl alcohol, ethylene glycol and its monomethyl ether, gylcerol alpha-monochlorohydrin, and certain tautomeric substances such as dioxane may be used. In all cases a product is obtained containing the alkyl or aryl group, as the case may be, in combination with the lignin." Advantage is frequently taken of this reaction to isolate lignin for further study.

Several years ago Charbonnier (*3*) reported an apparent exception to this condensation in the case of butyl alcohol under certain conditions of *p*H, basing his conclusions principally on his interpretation of ultraviolet absorption curves, the identification of butyl alcohol after mild hydrolysis of lignin isolated with butyl alcohol, and on methoxyl content.

The purpose of this report is to describe experiments undertaken to learn additional facts which might aid in clarifying the conflicting papers and the resulting confusion in the literature noted by Phillips (*8*).

Description of Experiments

Modern tracer technics lend themselves admirably to the determination of condensation between constituents of a reaction. Ideally, butyl alcohol containing radioactive carbon would be an almost perfect tracer. Practically, butyl alcohol containing substituent radicals which could be traced after conclusion of the reaction, were employed in these experiments. These reagents included 2-amino-1-butanol and 2-nitro-1-butanol.

Preparation of lignin with 2-amino-1-butanol and 2-nitro-1-butanol. The reagents were purified by fractionation at reduced pressure in a column having an efficiency equivalent to 40 theoretical plates.

Wood samples consisting of the heartwood of western hemlock (*Tsuga heterophylla* Sarg.), aspen (*Populus tremuloides* Michaux), and jack pine (*Pinus banksiana* Lambert) were reduced in entirety to pass a 40-mesh screen in a Wiley mill. These samples were extracted separately with water, and the alcohol-benzene azeotrope for four hours with each solvent in a Soxhlet apparatus.

One series of digestion liquors consisted of 2-amino-1-butanol with modifications as noted:

Liquor No. 1. Fifty ml. of aminobutanol diluted to 100 ml. with water alone; had a *p*H of 12.0 as measured with the glass electrode.

Liquor No. 2. Fifty ml. of aminobutanol diluted with hydrochloric acid and water in such proportions that the final 100 ml. of solution had an electrometric *p*H of 7.0.

Liquor No. 3. Fifty ml. of aminobutanol, 2 g. of sodium hydroxide, diluted with water to make 100 ml. of solution. The electrometric *p*H was beyond the upper range of meter (13.0).

Liquor No. 4. Fifty ml. of aminobutanol, 0.5 g. of hydrochloric acid, and diluted with water to make 100 ml. of solution. Electrometric *p*H was 11.2.

Liquor No. 5. Fifty ml. of aminobutanol diluted with hydrochloric acid and water in such proportions that the final 100 ml. of solution had an electrometric *p*H of 0.8 (the *p*H of water alone, containing 0.5 per cent of hydrochloric acid).

A parallel series of liquors was prepared by substituting 2-nitro-1-butanol for 2-amino-1-butanol as follows.

Liquor No. 6. Parallel to Liquor No. 1, contained nitrobutanol and water alone, had an electrometric *p*H of 2.6.

Liquor No. 7. Parallel to Liquor No. 2, adjusted to an electrometric *p*H of 7.0 with sodium hydroxide.

Liquor No. 8. Parallel to Liquor No. 3, contained 2 g. of sodium hydroxide, electrometric *p*H of 9.2.

Liquor No. 9. Parallel to Liquor No. 4, contained 0.5 g. of hydrochloric acid, electrometric *p*H of 0.6.

A nitrobutanol liquor parallel to Liquor No. 5 was omitted because of the similarity to Liquor No. 9. All of the aminobutanol liquors were homogeneous solutions; all of the nitrobutanol liquors had two layers.

Digestions were carried out by placing 100 ml. of liquor and 5 g. of oven-dry wood sample in a stainless steel autoclave, heating at 160 C. for four hours with agitation, cooling to room temperature and removing the entire reaction mixture.

The reaction mixture was filtered, neutralized to an electrometric *p*H of 7.0, and evaporated to dryness at a pressure of 15 mm. in a glass flask heated on a bath of Wood's metal. After dryness was reached, the pressure in the flask was reduced to about 1 micron (McLeod gauge) and the bath temperature held at 100 degrees for one-half hour. The residue in the flask, a reddish brown resin was then dissolved in ethanol, forming a clear, reddish brown solution which was poured dropwise into ten times its volume of water at 0 C. A light-tan, flocculent precipitate was formed and filtered off. Some of the ethanol solution of the reaction mixture from the digestions with aminobutanol remained dissolved in the water and was recovered by evaporating the water to dryness. The residue from this evaporation was evacuated at a pressure of about one micron and a temperature of 100 degrees for one-half hour. The amount of water-soluble material from the nitrobutanol digestions was small and was not analyzed.

The light tan, flocculent precipitate which was filtered off was dissolved three successive times in ethanol and precipitated by pouring into a large volume of ether. The final precipitate was then evacuated at a pressure of about one micron and a temperature of 100 degrees.

Blank digestions were carried out under similar conditions with the substituted alcohols and water alone, and in the presence of hydrochloric acid and sodium hydroxide in the concentrations specified above. The reaction mixtures were then neutralized to an electrometric *p*H of 7.0, distilled to dryness at a pressure of 15 mm., then evacuated to a pressure of about one micron at a temperature of 100 degrees for one-half hour. The flask was then washed out thoroughly with 20 ml. of boiling ethanol, the resulting solution evaporated to a volume of 1 ml., 0.1 g. of phenol added, evaporated to dryness, and analyzed qualitatively for nitrogen as described below. Nitrogen-containing material was absent in all of these end-products, demonstrating that reaction products of the reagents alone were not responsible for the presence of nitrogen in the reaction products formed in the presence of wood.

Analysis for nitrogen. Qualitative tests for nitrogen were made by fus-

ing 0.05 g. samples of the reaction products with metallic sodium. The fusion mixture was diluted to 20 ml. with water, from which 3 ml. were withdrawn, boiled with 5 drops of 6 *N* sodium hydroxide and 5 drops of 5 per cent ferrous sulphate solution. Finally the solution was acidified with 6 *N* sulphuric acid. The appearance of a blue precipitate was accepted as evidence of nitrogen. Quantitative tests for nitrogen were made by the Hengar modification of the Kjeldahl method.

Experimental Results

In the qualitative tests, all of the reaction products gave positive tests for the presence of nitrogen. The results of the quantitative analyses are shown in Table 1.

In physical appearance, the water-insoluble amino-butanol lignins ranged from a pale tan to a light brown amorphous powder, while the water-soluble fractions were reddish brown syrups when exposed to air and were reddish brown gums or resins when allowed to stand over phosphorus pentoxide. The appearance of nitrobutanol lignin was generally similar except that the water-soluble fraction was negligible. The filtered reaction mixture from the amino-butanol digestions was homogeneous and remained homogeneous and without formation of a precipitate upon addition of either base or acid. The filtered reaction mixtures from the nitrobutanol digestion had two layers, the aqueous layer being the lighter. In acidic solutions of nitrobutanol, the lignin was dissolved in the nitrobutanol layer; in alkaline solutions the lignin was partitioned between the two layers.

Discussion

Nitrogen was found in all of the reaction products from amino-butanol. Since the work of Hess and Heumann (*5*) indicated that hydrazine condensed with lignin, it was considered essential to examine the possibility that the amino group of the aminobutanol was responsible for the condensation. When the nitrobutanol was substituted for the aminobutanol, generally similar condensation occurred. It thus seems likely that the condensation between the alcohol and the lignin occurred through the hydroxyl of the alcohol.

The quantity of nitrogen found in the reaction products did not have sufficient variation, in the light of present knowledge, to justify more than limited interpretation. It appeared that the substituted butanol combined with lignin to about the same general degree, regardless of *p*H, the presence of sodium hydroxide or hydrochloric acid, or salt formation between acid and amine. It is suggested that the polar properties of aminobutanol were responsible for the water-solubility of part of the reaction product of aminobutanol and lignin since the nitrogen content of the water-soluble fraction was higher than that of the water-insoluble product.

The molecular weight of the condensation product of *n*-butanol with hemlock lignin, determined by the cryoscopic method with beta napthol as solvent, was abount 420 (*1*). It should be emphasized that this value is an *average* value and has only limited significance, certainly not sufficient to permit hypothesis of either empirical or constitutional formulas such as those of Charbonnier (*3*). Molecular distillation (*2*) and variable elementary composition (*2*) have shown the reaction product to be a mixture, and not a single compound or complex. With these limitations in mind, it seems that the nitrogen contents were less, or approach, the value which would be found if one molecule of substituted butanol had combined with another molecule having a molecular weight of 420.

The condensation of aminobutanol with lignin agrees with the findings of Reid, Dryden, and Aronovsky (*6*) who found that nitrogen-containing compounds were formed when ethanolamine reacted with corncob lignin. Fisher and Bower (*4*) also found that the reaction of ethanolamine upon cornstalks introduced 1-3 per cent of nitrogen into the lignin.

The occurrence of nitrogen in the reaction products suggests that *n*-butanol likewise condenses with lignin to form condensation products. The failure of Charbonnier (*3*) to find evidence of such condensation by hydrolysis was undoubtedly due to the mildness and character of the cleaving reaction he used: 72 per cent of sulphuric acid at room temperature and 3 per cent sulphuric acid at the boiling point. The hydrolytic tests of Charbonnier failed to recognize that *n*-butanol could have reacted with lignin: 1. to form an alkyl ether, 2. by simple addition, 3. in a manner similar to the so-called "aldol water" condensation, or 4. by rearrangement. All of these are active possibilities but none of these would have been detected by Charbonnier's hydrolysis. Charbonnier's hydrolysis would have split little except ester linkages; not even butoxyl would have been detected, since it is well known that methoxyl is not hydrolyzed by 72 per cent sulphuric acid at room temperature nor boiling 3 per cent sulphuric acid.

The occurrence of nitrogen in the reaction products questions the validity of Charbonnier's interpretation of the methoxyl contents of lignin prepared in the presence of *n*-butanol. His assumptions that similarity or dissimilarity of methoxyl contents pro-

(Turn to page 1611)

TABLE I—Nitrogen Content of Reaction Products

Liquor and wood species	Alcohol used	pH, alkali or acid added	N content	
			H_2O insol. fraction	H_2O sol. fraction
No. 1 Hemlock	Amino-BuOH	12.0, none	1.7	2.4
No. 1 Aspen	"	" "	1.9	2.5
No. 1 Pine	"	" "	1.8	2.1
No. 2 Hemlock	"	7.0, HCl added	1.5	2.1
No. 2 Aspen	"	" " "	1.7	2.1
No. 2 Pine	"	" " "	1.4	2.0
No. 3 Hemlock	"	2% NaOH	1.9	2.6
No. 3 Aspen	"	" "	1.8	2.8
No. 3 Pine	"	" "	1.9	2.4
No. 4 Hemlock	"	11.2, 0.5% HCl	1.7	2.5
No. 4 Aspen	"	" " "	1.8	2.5
No. 4 Pine	"	" " "	1.8	2.2
No. 5 Hemlock	"	0.8, HCl added	1.4	2.0
No. 5 Aspen	"	" " "	1.6	2.1
No. 5 Pine	"	" " "	1.5	1.9
No. 6 Hemlock	Nitro-BuOH	2.6, none	1.6	
No. 6 Aspen	"	" "	1.9	
No. 6 Pine	"	" "	1.5	
No. 7 Hemlock	"	7.0, NaOH added	1.5	
No. 7 Aspen	"	" " "	1.6	
No. 7 Pine	"	" " "	1.5	
No. 8 Hemlock	"	9.2, 2% NaOH	1.7	
No. 8 Aspen	"	" " "	1.7	
No. 8 Pine	"	" " "	1.6	
No. 9 Hemlock	"	0.6, 0.5% HCl	1.4	
No. 9 Aspen	"	" " "	1.6	
No. 9 Pine	"	" " "	1.4	

Recovery of Heat and Chemicals in Sulphate Recovery Furnace Stack Gases

T. T. COLLINS, JR.*
and
RUTH H. COLLINS

A REVIEW OF THE LITERATURE

▶▶▶ THE LITERATURE ON THE subject of waste gases from the paper industry is quite extensive and covers a considerable amount of information in connection with sulphate and soda recovery furnace gases and their elimination. Previous reviews which include stack gases have been published by Schrohe and West (*1*), West (*2*), Jakobson (*3*), and Pasche (*4*).

Sodium losses in both the soda and sulphate recovery systems have been analyzed by many investigators using various testing methods. It is difficult to correlate the data given in the literature, not only because some of the testing methods may have been in error, but also because great variations in these losses exist from mill to mill depending upon the type of recovery furnace installation and the manner in which it is operated. The use of disc evaporators or spray washers for evaporating black liquor with the furnace gases also causes marked differences. For comparison of the results of measurements given by the different sources, Tables 1 and 2 have been prepared.

TABLE 1—Losses of Sodium Salts in Stack Gases from Sulphate and Soda Recovery Furnaces (American Practice)

Source	Process and Furnace	Alkali Losses (lb./ton of pulp)	Gas Dust Loadings (grains/cu.ft.)
Whitney and Vivian (*5*)	Soda-Spray	40 — Na_2O	1.08 (b)
"	"	5.2 — Na_2O (a)	0.14 (a, b)
Gardner and Whitney (*6*)	Soda-Rotary	35 — Na_2CO_3 or 19 — Na_2O	0.44 (b)
"	Sulphate-Spray	98 — Na_2SO_4 or 41 — Na_2O	1.1 (b)
Murdock (*7*)			2.4 (c)
			1.2 (d)
Anderson (*8*)	Sulphate-Spray	90 to 200 — Fume (Average 142)	
"	Sulphate-Rotary	50 to 155 — Fume (Average 91)	
"	Soda-Spray	103 — Fume	
"	Soda-Rotary	40 — Fume	
Savell (*9*)	Sulphate-Rotary	65 to 80 — Na_2SO_4	
"	Sulphate-Spray	201 — Na_2SO_4	
Sultzer and Beaver (*10*)	Sulphate-Rotary	20 to 68 — Na_2O (Average 40)	
"	Sulphate-Spray	40 to 85 — Na_2O (Average 65)	
"	Soda-Spray	59 — Na_2O	
"	Soda-Rotary	30 to 67 — Na_2O (Average 43)	
Anderson (*11*)	Sulphate	57 to 85 — Na_2O	
Kress (*12*)	Sulphate	150 — Na_2SO_4	
Roberts (*13*)	Sulphate		2 to 5 (e)
Graff (*14*)	Sulphate-Spray	149 — Dust	1.4 (b)
Patterson (*19*)	Sulphate-Spray	117 — Dust	
"	Sulphate-Spray	2 — Dust (a)	

(a) After a Cottrell precipitator
(b) At stack conditions
(c) At 32 deg. F. and 29.92 inches Hg before a disc evaporator
(d) At 32 deg. F. and 29.92 inches Hg after a disc evaporator
(e) At 32 deg. F. and 29.92 inches Hg based on dry gas

Lb./ton of pulp × 0.5 = kg./metric ton of pulp
Grains/cu. ft. × 2.288 = grams/cu. meter

The loss of sodium salts from soda and sulphate recovery furnaces results from a combination of causes. Gardner and Whitney (*6*) attributed the dust loss to entrainment of particles from the fuel bed in the furnace, a carryover of dried and ignited black liquor, and the volatilization and subsequent condensation of sodium salts. Liander and Olsson (*29*) have shown sodium sulphate to be the least volatile of the sodium salts in the furnace and theorized that sodium hydroxide, the most volatile of the salts present, vaporizes and on condensing reacts with sulphur dioxide to form sodium sulphite. The latter is then oxidized to sodium sulphate. Liander (*30*) later showed that in the presence of oxygen at high temperature both sodium sulphite and sodium sulphide oxidize to form sodium sulphate. The sulphate and carbonate of sodium were found to have higher volatilization temperatures than the oxide and the loss of sodium salts by volatilization increased markedly above 1150 C. Contrary to these theories, Day (*31*) suggested the fume loss is due to volatilization of sodium sulphate rather than mechanical entrainment. Dorenfeldt-Holtan and Holtan (*32*) believed salt cake in the dust is due to reaction of sulphur dioxide and sulphur trioxide with sodium carbonate and subsequent oxidation of the sulphite to sodium sulphate since there is very little of the latter in the smelt.

This difference in volatilization temperature of the various sodium compounds and mechanical carryover of dust or ignited black liquor from the furnace is known to result in variations in the salt cake content of the fume from the sulphate process as shown in Table 3.

Anderson (*33*) has given the following analysis of a scrubber liquor which presumably would represent to some extent the relative proportions of the various components of the sulphate recovery furnace fume.

Na_2S — 0.51 lb. Na_2O/cu. ft. of liquor
Na_2SO_3 — 1.13 lb. Na_2O/cu. ft. of liquor
Na_2SO_4 — 0.81 lb. Na_2O/cu. ft. of liquor

(*) Thilmany Pulp & Paper Co., Kaukauna, Wis.

TABLE 2—Losses of Sodium Salts in Stack Gases from Sulphate and Soda Recovery Furnaces (European Practice)

Source	Process and Furnace	Alkali Losses (kg./metric ton of pulp)	Gas Dust Loadings (grams/cu. meter)
Hägglund (*15, 16*)	Sulphate-Rotary	25 to 35 — Na_2SO_4	
Edling (*17*)	Sulphate		4 (f)
"	"		0.7 (g)
Segerfelt (*18*)	"		6.5
Anon. (*20*)	"	4 — Na_2SO_4 (h)	
Sieber (*21*)	"	20 to 25 — Na_2SO_4	
Apler (*22*)	"	40 — Na_2SO_4	
Schwalbe (*23*)	"	80 to 150 — Na_2SO_4	
Klason (*24*)	"	133 — Na_2SO_3	6.0
Anon. (*25*)	"		0.2 (i)
Schwalbe (*26*)	"	127 — Na_2S	6.0
Venemark (*27*)	"	6 — Na_2SO_4 (Calculated)	
"	"	43 — Na_2SO_4	
Venemark (*28*)	Sulphate-Spray	64 to 83 — Na_2SO_4	
"	"	69 — Na_2SO_4 (j)	
"	"	63 — Na_2SO_4 (k)	
"	"	240 — Na_2SO_4 (j, l)	
"	"	54 — Na_2SO_4 (k)	
"	Sulphate-Rotary	30 — Na_2SO_4 (m)	
"	"	23 — Na_2SO_4 (n)	
"	Sulphate-Dried Black Liquor Fuel	22 — Na_2SO_4	
Vishnevsky (*109*)	Sulphate-Wagner	25 to 75 — dust	1.5 to 21.2 (o) (3.5 to 9.5 Av.)

(f) At 0 deg. C. and 760 mm. Hg before an INKA saturator
(g) At 0 deg. C., and 760 mm. Hg after an INKA saturator
(h) After Nyquist discs and a concentrator
(i) At 0 deg. C. and 760 mm. Hg after a rotary economizer-scrubber
(j) Before scrubber
(k) After scrubber
(l) Sampling while blowing soot
(m) Before discs
(n) After discs
(o) At standard conditions

Kg./metric ton of pulp × 2.0 = lb./ton of pulp
Grams/cu. meter × 0.437 = grains/cu. ft.

Acidity equivalent — 0.13 lb. H_2S/cu. ft. liquor
Acid insoluble and carbon — 0.017 lb./cu. ft. liquor

In addition to the variations in chemical composition, some of the physical characteristics of the sulphate recovery furnace fume are of interest. Obviously the solid particles in the waste gases are so fine that the dust should be called fume. Day (*31*) stated that soda fume particles are less than 0.5 microns in diameter and Murdock (*7*) has said that 85 per cent of the particles are less than 1 micron in diameter. The latter explained that recovery of a high percentage by weight may mean the recovery of a small percentage by numbers of particles if the fines are not collected. It is necessary from the smoke nuisance standpoint to remove the fines in order to eliminate the fume cloud. Venemark (*28*) held a microscope slide in the stack gases and observed that the fume was mostly in the range 0.5 to 2 microns with some particles up to 20 microns but the latter did not exceed 1 to 2 per cent. Kleinschmidt and Anthony (*34*) estimated that recovery furnace fume has most of its particle diameters in the range of 0.2 to 2.0 microns. Vishnevsky (*109*) analyzed dust samples with the microscope and found particle sizes to be in the range of 10 to 100 microns. However, he admitted they were measuring particle agglomerates.

The fume particles have also been considered as having a negative electrostatic charge by Wagner (*35, 36, 37,* and *38*) and Webster and Wagner (*39*). This charge has been said to make the fume particles "resistant to wetting." Patterson (*19*) has mentioned that some fume particles have a positive charge and others are given a negative charge in the Cottrell precipitators.

Although the sodium in the stack gases represents an important economic loss, the technical disadvantages of the disproportionate loss of sulphur relative to sodium at this point has been recognized by Venemark (*27, 28*), Whitney and Vivian (*5*), Edling (*40*), Savell (*9*), and others. Venemark (*27, 28*) mentioned increasing sulphur losses with increasing sulphidity of the liquor and Edling (*40*) said his experience has been that although the sulphur loss is greater than the alkali loss in most cases, it is less in spray furnaces than from rotary furnaces with a resulting higher sulphidity of liquor in the former case. Savell (*9*) showed that drying and burning of black liquor causes the sulphur to be evolved as hydrogen sulphide and burned to sulphur dioxide which passes out with the stack gases. This demonstrates why sulphidity of the regenerated liquor does not build up and why it is difficult to maintain a high sulphidity. It was Savell's opinion that this sulphur loss cannot be prevented by any method of operating the recovery furnace. Tomlinson and coworkers (*41*) mentioned that this high loss of sulphur as hydrogen sulphide occurs in direct evaporators for black liquor. A value for the stack loss of sulphur has been given by Kajala (*42*) as 17.4 kg., by Venemark (*28*) as 15.6 kg., by Bergstroem and Trobeck (*43*) as 10.4 kg. of sulphur, and by Klason (*24*) as 16.8 kg. of sulphur dioxide, all per metric ton of pulp.

Dorenfeldt - Holtan and Holtan (*32*) have investigated and found the sulphur to sodium ratios at various points of the recovery system to be as follows:

	S/Na
Smelt	0.164*
Black ash	0.118
After discs	0.1875
Before discs	0.139
Na_2SO_4	0.696

(*) Salt cake was added to the smelter.

They found that 56.25 per cent of the total sulphur to the recovery system was lost in the rotary burner and smelting furnace but 17.25 per cent of that total sulphur was absorbed in the disc evaporators to give an overall loss of 39 per cent of the total sulphur. It is interesting to note that 9.45 per cent of the total sulphur was lost in the form of sodium salts which is only about a quarter of the sulphur lost.

The presence of sulphuric acid in sulphate stack gases has been mentioned by Textor (*44*) and Wagner (*35*) claimed the sulphur is lost not as sulphur dioxide but as carbon oxysulphide. According to Liander (*30*), the organic sulphur compounds of the burning black liquor partly form sulphur dioxide which is lost.

The presence of other sulphur gases in the recovery furnace has been recognized by several investigators (Table 4). Although many claims have been made that those gases derive their odor from mercaptans, Hägglund and Hedlund (*45*) pointed out that the amount of mercaptan may be negligible

TABLE 3—Composition of Sulphate Recovery Furnace Fume

Source	Percentage				
	Na_2SO_4	Na_2SO_3	Na_2CO_3	NaCl	$NaHSO_4$
Anderson (*11*)	75 to 67		25 to 33		
Gardner and Whitney (6)	87	0			11
Roberts (*13*)	Most				
Graff (*14*)	70		30		
Day (*31*)	94	0.8	2.5		
Anderson (33)	90 (a)				
Hägglund (*16*)	96				
Venemark (*28*)	58 to 91	1 to 10	2 to 33	2 to 5	
Patterson (*19*)	53.5 (a)		28.5	18.0	
Vishnevsky (*109*)	93 to 97		1 to 3		

(a) Recovered by a Cottrell precipitator

ible but might vary from mill to mill. Venemark (*28*) confirmed these results. Denisov (*46*) has shown that the dry distillation of black liquor caused over 50 per cent of the sulphur to be lost as hydrogen sulphide and methyl mercaptan.

The interest shown in the qualitative and quantitative measurement of chemical losses in the stack gases from recovery furnaces indicates that operators of pulp mills have recognized the economic and technical importance of "after-the-furnace" chemical recovery. The value of the waste heat in the stack gases has not been overlooked although it is usually heat at such a low level that ordinary methods of utilizing more than a minor proportion of it are not too feasible unless elaborate equipment is employed. Most mills utilize the heat in the stack gases leaving the recovery furnace boiler by passing them through preheaters for air entering the furnace and/or then into disc evaporators or other types of scrubbers where much of the remaining sensible heat of the gases above the saturation temperature is utilized for the evaporation of black liquor. This arrangement for saturating the gas by evaporating liquor does not change the total heat content of the gas but merely converts the sensible heat of the gases above the saturation temperature into latent heat of vaporization of the water evaporated. There are no heat recovery systems of known importance operating in the United States for reclaiming the tremendous quantity of heat of vaporization in the stack gases although several systems are in use in Scandinavia and in Canada.

Ordinarily, the heat recovery systems operate on some scrubbing principle and produce hot water in addition to washing some of the chemical fume from the stack gases. In the INKA and Ramén systems which are to be described later, the latent heat of vaporization is used to some extent for the evaporation of black liquor, and in the system devised by Tomlinson and coworkers (*41*) in Canada it is used for heating water for washing pulp.

In discussing the possibilities of heat recovery from the flue gases, the magnitude of this loss should be realized. Tomlinson and co-workers (*41*) and Wilcoxson and Ely (*48*) have stated that approximately 35 per cent of the total heat produced by the combustion of organic material in the furnace is lost through the stack gases. One source (*49*) gives the heat recoverable by ordinary spray towers from the stack gases as 381 Btu (5.7 per cent) per pound of black liquor solids having a total heat content of 6,500 Btu per pound. This is a small proportion of the total heat in the stack gases. Kajala (*42*) has given a figure of 40 per cent of the available heat lost from a rotary furnace in the flue gases. Nauclér (*50*) stated the stack heat loss from a Tomlinson spray furnace amounts to 1.6 to 4 million calories per metric ton of pulp. By means of an INKA system installation, 900,000 calories per metric ton of pulp were regained in the form of hot water at 52 C. and this heat was said to be equal to 5,000 metric tons of coal a year. With the Tomlinson system (*41*), it is claimed that it is possible to produce 400 to 500 gpm of 165 Fahr. water after a 100 ton recovery furnace.

In most recovery furnace installations, particularly in the United States where fuel prices are comparatively low, there has been little or no effort made to recover the available heat in the stack gases below the saturation temperature in the form of hot water. This is due to the fact that many pulp mills already have an abundant supply of warm water so any more would be valueless unless it would be at a higher temperature. Until some practical scheme is devised for raising this heat to a higher and more usable level or using it in evaporating black liquor economically, this phase of the subject may not be of general interest.

As for the recoverable chemicals in the flue gases, particularly the fume of sodium salts, they represent a usable quantity of considerable economic value. Due to the present short supply of salt cake for make-up, their recovery may allow full time operation of some mills now faced with involuntary shutdown periods. Making the rough assumption that the equivalent of a third to one half of the total salt cake added per ton of pulp produced by the kraft process is lost in the waste recovery furnace gases, any reasonable method for reclaiming a portion of these chemicals appears justified.

Of the several methods which have been studied for the removal of fume from the stack gases, the Cottrell or electrostatic precipitator has been the most efficient apparatus devised. It

TABLE 4—Gaseous Sulphur Components in Recovery Furnace Stack Gases

Source	Concentration in grams/cubic meter				
	SO_2	H_2SO_3	H_2S	CH_3SH	$(CH_3)_2S$
Klason (*24*)*	0.700		0.004	0.013	
Schwalbe (*26*)*		0.700	0.400		
Boija (*47*)	2.34 (a)				
Hägglund and Hedlund (*45*)			0.500	0.0003	
Bergstroem and Trobeck (*43*)			1.300	2.650	0.320
Venemark (28)	0 to 0.4 (a) (Average 0.13)		0.03 to 0.88 (a) (Average 0.32)		
Tomlinson and co-workers (*41*)			0.0017 to 0.0028 (a, b)		
Segerfelt (*18*)			8.0 to 13.0		
Vishnevsky (*109*)	1.75 (a)				

* Schwalbe checked same furnace as Klason
(a) Standard conditions
(b) Oxidized black liquor used in furnace, gases sampled after the scrubber

Grams/cu. meter × 0.437 = grains/cu. ft.

was used in pulp mills as early as 1915 according to Sultzer and Beaver (*10*) and modern installations have been improved to the point where recovery efficiencies of 85 to 95 per cent of the dust can be expected. Discussions of various electrostatic precipitator installations have been given by Vishnevsky (*109*), Anderson (*8*), Whitney and Vivian (*5*), Hägglund (*15*), Brauns (*51*), Edling (*40*), Day (*31*), Murdock (*7*), Textor (*44*), TAPPI (*52*), Roberts (*13*), Landolt and Sultzer (*53*), Millidge, Taylor, and Heimrod (*54*), Graff (*14*), and Patterson (*19*). According to the literature there are two types of precipitators in operation, the "wet" and the "dry" types. In the wet type, the charged rods are continuously washed with water or recirculated fume solution and the gas entering the unit may be saturated. Wet precipitators have been badly corroded in sulphate mills but not soda mills, according to Roberts (*13*). In the dry type of unit the collecting rods are continuously rapped to knock the dust loose from them and the temperature of the gas through the precipitator must remain above the dew point. Some data on the electrical values required for a commercial installation have been given by Millidge, Taylor, and Heimrod (*54*). A scrubber was required for humidifying the gas going to a wet precipitator and the power consumption in the unit was approximately 4 kw-hr. per ton of pulp. Roberts (*13*) has given the figure of 2.8 to 3.5 kw-hr. per ton of pulp for total power cost and claimed no extra labor is required for operation. Sultzer and Beaver (*10*) mentioned the power requirement for both wet and dry Cottrells as being approximately 4 kw-hr. per ton of pulp. Another marked advantage of the Cottrell, according to Landolt and Sultzer (*53*), is the low pressure drop of ⅛ to ¼ inch of water across the installation compared to much higher draft losses for scrubbers, bag filters, etc.

As to the difficulties of operating Cottrell precipitators, Graff (*14*) and Patterson (*19*) have given discussions. Richter and Van Arsdel (*55*) pointed out the important fact that an electrostatic precipitator does not recover sulphur dioxide or heat from the flue gases. It is true that the initial installation costs of the electrostatic precipitators may prevent mills operating on a limited budget from investing in them and Liander (*30*) believed that scrubbing systems; such as the INKA system, may be more economical to operate than the Cottrell.

This article is in two parts. Part II will appear in an early issue of this magazine. Bibliography with Part II.

The Lignin-Alcohol Condensation

(Continued from page 1607)

vide a valid basis for comparison of amorphous reaction products are unreasonable because these amorphous reaction products are mixtures of variable composition. These assumptions are untenable after the above experiments indicate that the butyl radical condensed with lignin.

Charbonnier's interpretation of ultraviolet absorption spectra of alkali and other lignin from various sources by various chemical treatments seems to lack meaning since it is known that lignin preparations are mixtures. Virtually nothing is known of the number of components of the ligneous mixtures or the individual and summative effects of these components. Such attempts to interpret the ultraviolet absorption and methoxyl contents of lignin preparations do, however, emphasize the great need for a critical and exhaustive re-examination of these subjects to bring them to such a level that they can be employed soundly and intelligently.

The experiments reported here indicate that the presence of alkali does not inhibit the lignin-alkali condensation, nor does the pH, nor is the presence of acid necessary for the lignin-alcohol condensation with either amino- or nitro-butanol. The fact that nitrogen occurred in the isolated lignin indicated that the substituted butanol reacted with the lignin and was at least partially responsible for the delignification. Thus the delignification was not due to the presence of alkali alone nor was the substituted butanol inert, as Charbonnier claimed for *n*-butanol. It remains a possibility that the presence of alkali may cause an additional and independent change in one or more of the components of the ligneous mixture which results in a different ultraviolet absorption curve. If such a change is induced by alkali, it does not seem to inhibit the lignin-alkali condensation with the substituted butanols. If such a change occurs, it may occur either before or after the condensation, it may involve minor valence-shift or tautomerism of a minor component of the mixture or may involve deep-seated changes of far-reaching fundamental significance. It is likewise possible that the substituted butanols combined with some of the components of the lignin-system and not with others. Decisions on these questions require extensive, definite, and detailed information on the number of components of the various lignin-systems, the constitution of these components, their chemical behavior, and their ultraviolet absorptive properties, all of which are unknown at present.

The experiments reported above contribute chiefly by suggesting that butanol reacts with lignin in a manner analogous to that of the other alcohols: the alcohol condensing with the lignin. The catalogue of such a lignin preparation in the classification of the numerous and exceedingly diverse lignin preparations already known is presumably therefore as a lignin-alcohol condensation product having an alcohol residue combined to the lignin complex and conferring a structural addition and difference from such preparations as alkali lignin and sulphuric acid lignin. In general, present hypothetical constitutional formulas for lignin—for what they are worth—have yet to include this structural addition although it now appears that alcohols, without known exception, condense with the lignin.

Acknowledgment—Credit is due to the Commercial Solvents Corporation for supplying amino-and nitro-butanol.

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Paper Standardization

as an Aid to the Printer — Part 2

M. S. KANTROWITZ[1] and E. W. SPENCER[2]

▶▶▶ STANDARDIZATION OF paper in definite grades based on quality long has been recognized as desirable, particularly from the standpoint of the printer.

Quality of Paper

The United Typothetae of America and the Government Printing Office co-operated many years ago in a study of commercial brands of bond and ledger papers to determine those factors which indicate the quality and serviceability of these papers and to classify those factors with respect to their appropriate use.

The Government Printing Office submitted a report on this co-operative work to the standardization committee of the United Typothetae of America at its meeting in Quebec, Canada, on October 1, 1928, for the purpose of establishing commercial as well as Government standards for bond and ledger papers. It was agreed at that meeting that the standardization committee would hold a conference with representatives of bond and ledger paper manufacturers to consider the adoption of the proposed standards by the printing trade and by papermakers.

The standards proposed were adopted by the Joint Committee on Printing in the purchase of bond and ledger papers for the Government Printing Office and since then have been in satisfactory use by the Government. The specifications cover five grades each of bond and ledger, including papers with 100 per cent, 75 per cent, 50 per cent, and 25 per cent of rag stock, and 100 per cent chemical wood pulp.

Beginning with paper that was furnished under contracts awarded for the year commencing March 1, 1929, bond and ledger papers for the Government Printing Office have been specially watermarked to show the rag content of each sheet of paper. The watermark consists of the seal of the United States with a halo of one star for 25 per cent rag paper, two stars for 50 per cent, three stars for 75 per cent, and four stars for 100 per cent. The chemical wood papers are not watermarked.

The full-size watermark designs required for each grade of rag writing, rag bond, and rag ledger papers are here reproduced.

Following are the specifications for the purchase of bond and ledger papers:

CHEMICAL WOOD BOND, WHITE AND COLORED

Specifications

Stock: Free from unbleached or groundwood pulp.
Ash: Not to exceed 5 per cent.
Acidity: *p*H value not less than 4.5 for white and 4.2 for colored.
Sizing: Rosin not to exceed 2.0 per cent.

Weight: 17 x 22, 1,000.....pounds...	26	32	40	48
Folding endurance: Average, each direction, not less than.....double folds...	50	80	80	80
Bursting strength: Average not less than.....points...	19	24	30	36

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.
Color, finish, formation, and cleanliness: Deliveries must conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.

25% RAG BOND, WHITE AND COLORED

Specifications

Stock: Not less than 25 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.
Ash: Not to exceed 2 per cent.
Acidity: *p*H value not less than 4.5 for white and 4.2 for colored.
Sizing: Tub-sized. Rosin not to exceed 1.7 per cent.

Weight: 17 x 22, 1,000.....pounds...	26	32	40	48
Folding endurance: Average, each direction, not less than.....double folds...	65	100	100	100
Bursting strength: Average not less than.....points...	22	28	35	42

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.
Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.
Watermark: Only the seal of the United States, with one (*) star, on a basis of four times on a sheet 16 x 21 inches, once in each quarter. In sizes 21 x 32 inches and 32 x 42 inches, substances 32 and 40, white, all sheets must be packed with the designs running in the same direction; the bars in the shield to run parallel with the 21-inch and 42-inch sides of the sheets. The copy for this specified design will be supplied by the Public Printer.

50% RAG BOND, WHITE AND COLORED

Specifications

Stock: Not less than 50 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.
Ash: Not to exceed 2 per cent.
Acidity: *p*H value not less than 4.5 for white and 4.2 for colored.
Sizing: Tub-sized. Rosin not to exceed 1.5 per cent.

Weight: 17 x 22, 1,000....pounds...	26	32	40	48
Folding endurance: Average, each direction, not less than...double folds...	100	150	150	150
Bursting strength: Average not less than.....points...	26	32	40	48

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.
Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.
Watermark: Only the seal of the United States, with two (**) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter. In sizes 21 x 32 inches and 32 x 42 inches, substances 32 and 40, white, all sheets must be packed with the designs running in the same direction; the bars in the shield to run parallel with the 21-inch and 42-inch sides of the sheets. The copy for this specified design will be supplied by the Public Printer.

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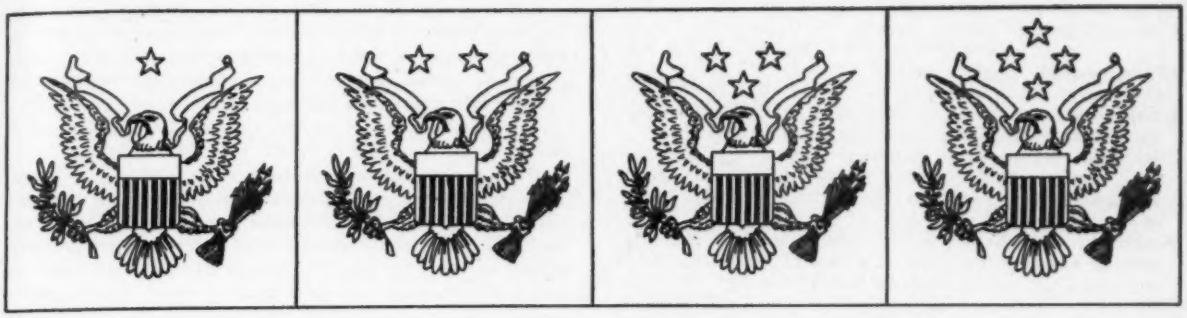
(1) Technical Director and (2) Assistant Technical Director, U. S. Government Printing Office, Washington, D. C. Published by permission of the Hon. A. E. Giegengack, Public Printer of the United States.



United States Government Watermarks used to identify and indicate the rag content of writing, bond, and ledger papers. One star indicates 25 per cent rag fibers; two stars indicate 50 per cent rag fibers; three stars indicate 75 per cent rag fibers; four stars indicate 100 per cent rag fibers. The difference between 100 per cent and the percentages shown is in each case bleached chemical wood fiber

75% RAG WHITE BOND

Specifications

Stock: Not less than 75 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 4.7.

Sizing: Tub-sized with animal glue. Rosin not to exceed 1.2 per cent.

Weight: 17 x 22, 1,000.....pounds...	26	32	40	48
Folding endurance: Average, each direction, not less than...double folds...	250	400	400	400
Bursting strength: Average not less than .....points...	29	36	45	54

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried and conform to the standard sample.

Watermark: Only the seal of the United States, with three (***) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter. The copy for this specified design will be supplied by the Public Printer.

100% RAG WHITE BOND

For Permanent Records

This paper must be made with every precaution to insure the maximum serviceability and permanency. Care must be taken to use the minimum quantities of bleach, rosin size, and alum. The finished paper must not show the presence of any injurious residual chemicals which will interfere in any way with the permanency of color or the serviceability and durability of the paper.

Specifications

Stock: 100 per cent new cotton or linen fibers.

Alpha cellulose: Not less than.....per cent... 95

Copper number: Not to exceed 1.0.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 5.0.

Sizing: Tub-sized with high-grade animal glue. Rosin not to exceed 1.2 per cent.

Weight: 17 x 22, 1,000.....pounds...	32	40	48
Folding endurance: Average, each direction, not less than.....double folds...	800	1,000	1,200
Bursting strength: Average not less than .....points...	45	55	65

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried and conform to the standard sample.

Watermark: Only the seal of the United States, with four (****) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter. In sizes 16 x 21 inches and 17 x 22 inches, all sheets must be packed with the designs running in the same direction; the bars in the shield to run parallel with the 21-inch and 22-inch sides of the sheets. The copy for this specified design will be supplied by the Public Printer.

SULPHITE WHITE LEDGER

Specifications

Stock: Free from unbleached or groundwood pulp.

Ash: Not to exceed 5 per cent.

Acidity: *p*H value not less than 4.5.

Sizing: Rosin not to exceed 2.0 per cent.

Weight: 17 x 22, 1,000.....pounds...	56	64	80
Folding endurance: Average each direction, not less than.....double folds...	80	100	125
Bursting strength: Average not less than..... .....points...	35	40	50

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must conform to the standard sample.

25% RAG LEDGER, WHITE AND COLORED

Specifications

Stock: Not less than 25 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 4.5 for white and 4.2 for colored.

Sizing: Tub-sized. Rosin not to exceed 1.7 per cent.

Weight: 17 x 22, 1,000....pounds...	48	56	64	72
Folding endurance: Average, each direction, not less than...double folds...	100	100	125	150
Bursting strength: Average not less than .....points...	34	39	45	50

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.

Watermark: Only the seal of the United States, with one (*) star, on a basis of four times on a sheet 16 x 21 inches, once in each quarter. The copy for this specified design will be supplied by the Public Printer.

50% RAG LEDGER, WHITE AND COLORED

Specifications

Stock: Not less than 50 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 4.5 for white and 4.2 for colored.

Sizing: Tub-sized. Rosin not to exceed 1.5 per cent.

Weight: 17 x 22, 1,000.pounds...	48	56	64	72	80	88

Folding endurance: Average, each direction, not less than..... .....double folds... 150 150 150 200 300 300

Bursting strength: Average not less than .....points... 38 44 50 56 58 60

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.

Watermark: Only the seal of the United States with two (**) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter, except substance Nos. 80 and 88. The copy for this specified design will be supplied by the Public Printer.

75% RAG LEDGER, WHITE AND COLORED

Specifications

Stock: Not less than 75 per cent cotton or linen fibers; the remainder free from unbleached or groundwood pulp.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 4.7 for white and 4.5 for colored.

Sizing: Tub-sized with animal glue. Rosin not to exceed 1.2 per cent.

Weight: 17 x 22, 1,000.pounds... 48 56 64 72 80 88

Folding endurance: Average, each direction, not less than..... .....double folds... 250 250 300 350 450 450

Bursting strength: Average not less than ....points... 42 49 56 63 65 67

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.

Watermark: Only the seal of the United States, with three (***) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter, except substances Nos. 80 and 88. The copy for this specified design will be supplied by the Public Printer.

100% RAG WHITE LEDGER

For Permanent Records

This paper must be made with every precaution to insure the maximum serviceability and permanency. Care must be taken to use the minimum quantities of bleach, rosin size, and alum. The finished paper must not show the presence of any injurious residual chemicals which will interfere in any way with the permanency of color or the serviceability and durability of the paper.

Specifications

Stock: 100 per cent new cotton or linen fibers.

Alpha-cellulose: Not less than.....per cent ... 95

Copper number: Not to exceed 1.0.

Ash: Not to exceed 2 per cent.

Acidity: *p*H value not less than 5.0.

Sizing: Tub-sized with high-grade animal glue. Rosin not to exceed 1.2 per cent.

Weight: 17 x 22, 1,000 .....pounds... 48 56 64 72 80 88

Folding endurance: Average each direction not less than..... .....double folds... 1,000 1,000 1,000 1,200 1,500 1,500

Bursting strength: Average not less than... .....points... 54 63 72 82 88 94

Ruling, writing, and erasing qualities: Shall be suitable for ruling and writing on with ink and have good erasing quality.

Color, finish, formation, and cleanliness: Deliveries must be air-dried; conform to the standard sample in finish, formation, and cleanliness, and match in color the sample furnished with order.

Watermark: Only the seal of the United States with four (****) stars, on a basis of four times on a sheet 16 x 21 inches, once in each quarter, except substances Nos. 80 and 88. The copy for this specified design will be supplied by the Public printer.

These specifications present the minimum requirements for fiber content and the physical and chemical properties for each grade of bond and ledger papers. Papers falling into these grades may in many instances possess qualities considerably above the minimum specified, but these minimum requirements will prevent unsatisfactory papers from being classed in grades in which they do not belong.

With paper standardized as it is in the Government Printing Office, it is a comparatively easy task for the estimator to choose the correct quality of paper to be used on each job. This would also be true in commercial printing plants or wherever paper is used in quantity, provided all paper was standardized on a quality basis. Each printer would then be quoting on the same quality of paper as that specified by the customer.

Standardization and simplification of the classes of book papers is fully as desirable as those of bonds and ledgers. Book papers find their place in a variety of publications varying from magazines to high class permanent books. The same high quality is not essential for all types of work, but the printer should be assured of getting the correct quality for the particular job. Such assurance can come only through quality standardization. For instance, low cost magazines use paper containing a considerable quality of groundwood. This paper is of adequate quality for the temporary purpose involved, but cannot be considered satisfactory for high quality magazines which might be destined to be bound into permanent volumes.

It has become the practice to use increasing quantities of de-inked stock and unbleached sulphite pulp in book papers intended for ordinary magazine publishing. The use of some de-inked stock may be justified in lightweight chemical wood book papers on the basis of the added opacity obtained by its use. It is undesirable to include unbleached pulp in paper intended for other than temporary uses.

MACHINE-FINISH BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.

Acidity: *p*H value not less than 4.5.

Weight: 25 x 38, 1,000.pounds..	60	70	80	100	120	140
Bursting strength: Average not less than..points...	10	11	12	15	19	22
Thickness: Average...inch...	.0020	.0022	.0027	.0032	.0037	.0047
Opacity: Not less than.per cent.	80	84	86	89	90	90
Oil penetration: Approximately. ....seconds...	35-45	40-50	45-55	55-65	65-75	75-85
Finish (smoothness): Average, seconds.....	100-200					

Color, formation, and cleanliness: Deliveries must conform to the standard sample in formation and cleanliness, and match in color the sample furnished with order.

SUPERCALENDERED BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.

Acidity: *p*H value not less than 4.5.

Weight: 25 x 38, 1,000..... .....pounds...	90	100	120	140
Bursting strength: Average not less than.....points	12	14	15	16
Thickness: Average...inch...	.0020	.0025	.0030	.0035
Opacity: Not less than..... .....per cent...	86	90	90	92
Oil penetration: Approximately ..... seconds...	50-60	55-65	65-75	80-100

Finish (smoothness): Average ..... seconds... 400-600 600-700

Color, formation, and cleanliness: Deliveries must conform to the standard sample.

ANTIQUE BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.
Acidity: pH value not less than 4.5.

Weight: 25 x 38, 1,000.....pounds...	90	100	120
Bursting strength: Average not less than .....points...	14	16	18
Thickness: Average.....inch...	.0038	.0040	.0050
Opacity: Not less than.....per cent...	89	90	91

Color, finish, formation, and cleanliness: Deliveries must conform to the standard sample.

50% RAG ANTIQUE BOOK

Specifications

Stock: Not less than 50 per cent cotton or flax fibers; the remainder free from unbleached or groundwood pulp.
Acidity: pH value not less than 4.5.

Weight: 25 x 38, 1,000.....pounds...	80	90
Bursting strength: Average not less than .....points...	14	16
Thickness: Average.....inch...	.0035	.0040
Opacity: Not less than.....per cent...	88	90

Color, finish, formation, and cleanliness: Deliveries must conform to the standard sample.

100% RAG ANTIQUE BOOK

Highest Quality for Permanent Records

This paper must be made with every precaution to insure the maximum serviceability and permanency. Care must be taken to use the minimum quantities of bleach, rosin size, and alum. The finished paper must not show the presence of any injurious residual chemicals which will interfere in any way with the permanency of color or the serviceability and durability of the paper.

Specifications

Stock: 100 per cent new cotton or flax fibers.
Acidity: pH value not less than 5.0.
Sizing: Rosin not to exceed 1.2 per cent.

Weight: 25 x 38, 1,000....pounds...	90	100	140
Folding endurance: Average, each direction, not less than....double folds...	75	75	150
Bursting strength: Average not less than ..... points...	25	28	40
Thickness: Average.....inch...	.0040	.0043	.0055
Opacity: Not less than.....per cent...	86	90	90

Color, finish, formation, and cleanliness: Deliveries must conform to the standard sample.

OFFSET BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.
Ash: Not less than 8 nor more than 15 per cent.
Acidity: pH value not less than 4.5.
Sizing: Tub-sized with starch.

Weight: 25 x 38, 1,000.....pounds...	80	100	120
Folding endurance: Average, each direction, not less than....double folds...	10	20	30
Bursting strength: Average, not less than .....points...	18	24	30
Thickness: Average.....inch...	.0025	.0035	.0040
Opacity: Not less than.....percent...	86	89	91

Moisture resistance: The paper must lie flat under all conditions.
Surface and finish: Shall withstand a Dennison No. 11A wax test on both sides of the sheet and be free from lint, fuzz, and loose particles which will pick or lift under normal press conditions. The paper must be suitable for four or more color lithograph offset printing on both sides of the sheet.
Formation: Shall be close and uniform.
Color and cleanliness: Deliveries must conform to the standard sample.

COATED BOOK

Specifications

Weight: 25 x 38, 1,000.....pounds...	100	120
Ash: Not less than 30 per cent.		
Folding endurance: Average, each direction, not less than.....double folds...	5	5
Bursting strength: Average not less than..... .....points...	11	13
Thickness: Average.....inch...	.0025	.0030
Brightness: Not less than 70 per cent.		
Finish (smoothness): Average not less than... .....seconds...	500	500

Coating and surface: Shall be uniform, free from mottle, and withstand a Dennison No. 4A wax test.
Color and cleanliness: Deliveries must conform to the standard sample.

COATED BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.

Weight: 25 x 38, 1,000.....pounds...	140	160
Folding endurance: Average, each direction, not less than.....double folds...	10	10
Bursting strength: Average not less than..... .....points...	18	20
Thickness: Average.....inch...	.0035	.0040
Finish (smoothness): Average not less than.... .....seconds...	800	

Coating and surface: Shall be uniform, free from mottle, and withstand a Dennison No. 4A wax test.
Color and cleanliness: Deliveries must conform to the standard sample.

DULL COATED BOOK

Specifications

Stock: Free from unbleached or groundwood pulp.

Weight: 25 x 38, 1,000.....pounds...	140
Folding endurance: Average, each direction, not less than.....double folds...	10
Bursting strength: Average, not less than.....points...	18
Thickness: Average.....inch...	.0035
Finish (smoothness): Average, not less than..seconds...	300
Gloss: Not more than.....per cent...	50

Coating and surface: Shall be uniform, free from mottle, and withstand a Dennison No. 4A wax test.
Color and cleanliness: Deliveries must conform to the standard sample.

LITHO COATED BOOK

Stock: Free from unbleached or groundwood pulp.

Weight: 25 x 38, 1,000.....pounds...	140
Folding endurance: Average, each direction, not less than.....double folds...	10
Bursting strength: Average, not less than.....points...	18
Thickness: Average.....inch...	.0035
Finish (smoothness): Average not less than..seconds...	800

Coating and surface: Shall be uniform, free from mottle and loose particles which will pick or lift under normal press conditions and shall withstand a Dennison No. 6A wax test. The paper must be suitable for lithograph offset printing on both sides of the sheet.
Color and cleanliness: Deliveries must conform to the standard sample.

The standards adopted by the U. S. Government have been found satisfactory for the Public Printing and Binding. Each standard paper should be considered separately, and the specifications should be drawn to assure the desired quality without increasing the cost by requiring certain qualities in excess of the actual need.

The first part of this article which was published in December, dealt with the subject of sizes and weights of paper. Part III will cover packaging requirements.

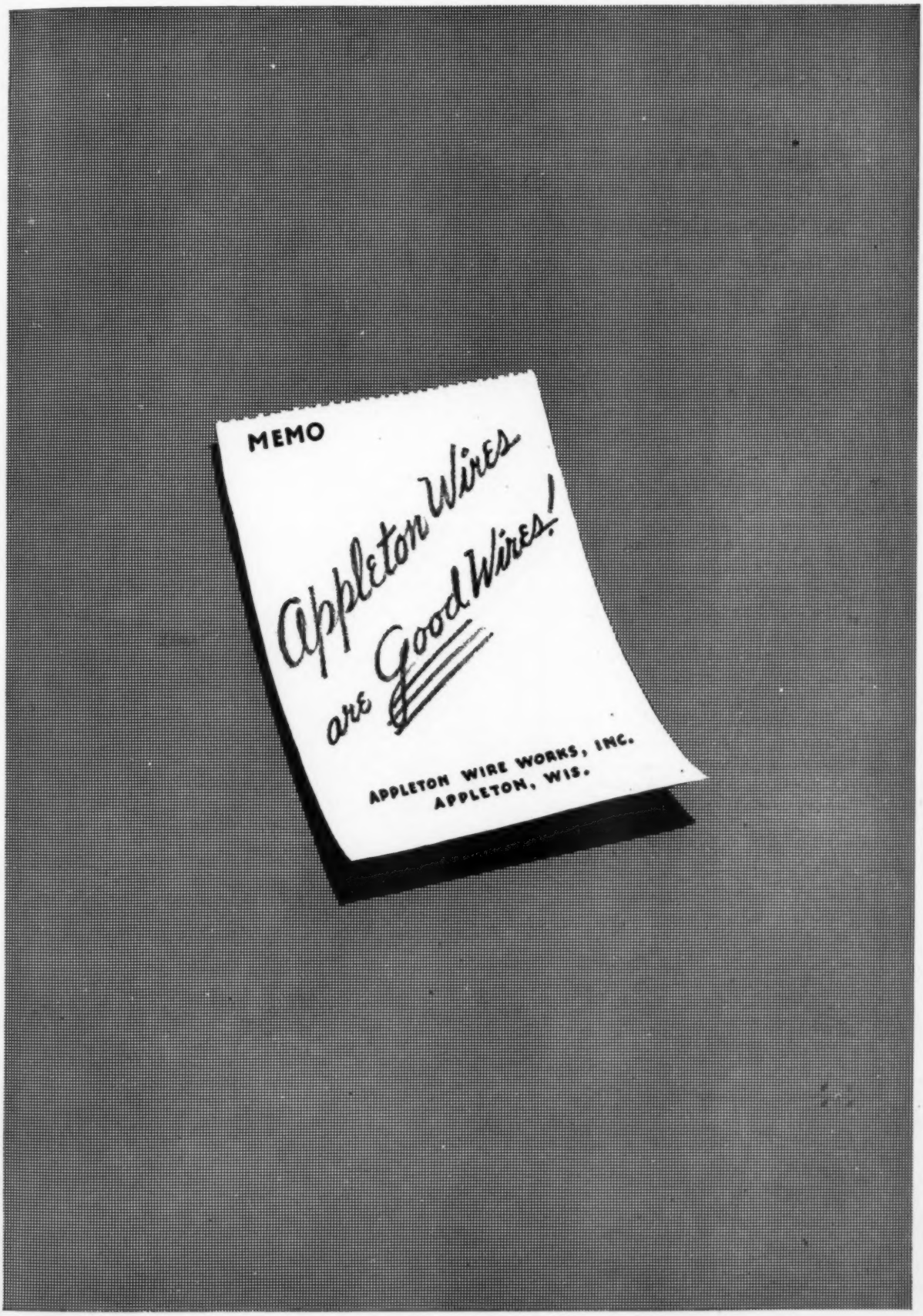
Paper SKETCHES . . . . . .

PETTICOATS MADE OF PAPER CAUSED QUITE A STIR WHEN THEY APPEARED ON THE MARKET IN 1870 AT 15¢ A GARMENT

IN THE 1500's, THE AZTECS MADE ROLLS OF AMATL-PAPER 15 FEET LONG

AS EARLY AS THE 900's, JAPANESE PAPERMAKERS WERE PAYING A TRIBUTE IN PAPER TO THE KEEPER OF THE EMPEROR'S STOREHOUSE

A DAILY PRODUCTION OF ABOUT 10 TONS OF DRY YEAST CAN BE MADE FROM THE WASTE SULPHITE LIQUOR OF A 100-TON MILL

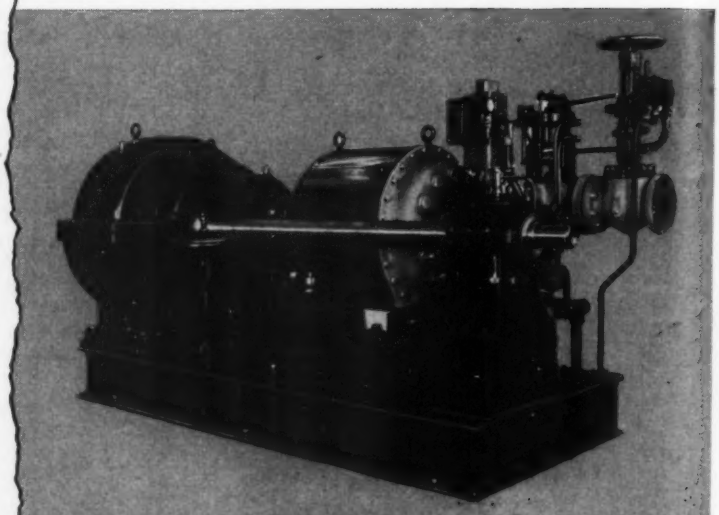

MEMO
Appleton Wires are Good Wires!
APPLETON WIRE WORKS, INC.
APPLETON, WIS.

ELIMINATE SPEED FLUCTUATIONS

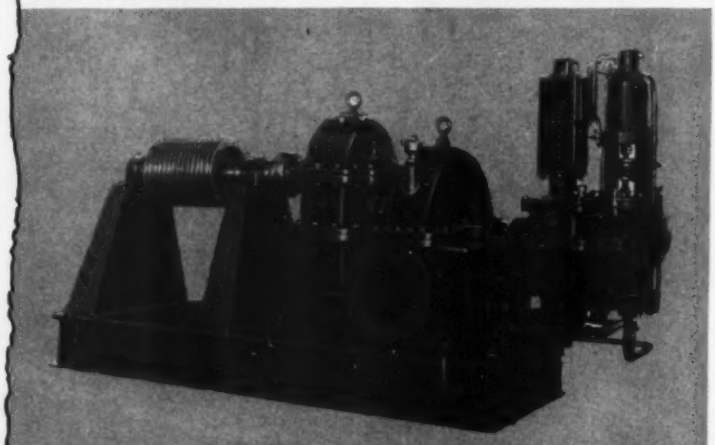
with Worthington Paper Machine Drives

Continuous steady speed operation invariably follows when Worthington Steam Turbines take over the driving job The isochronous governor assures no change in operating speed from minimum to maximum load for any given control setting A special single-seated governor valve or valves give stable operation at low loads. In addition, the governor is adjustable over complete range to accommodate any paper machine requirement — remote speed controls can be provided if desired. Turbine-driven auxiliary oil pump protects against shutdown from power failures.

Whether your conditions call for automatic or hand nozzle control, direct connection or belted to line shaft, you can depend on Worthington to manufacture a smooth-running, economical steam turbine for any size of paper or board machine. Call your nearest Worthington office for more information proving that — in steam turbines as in so much other equipment — *there's more worth in Worthington*. *Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.*



Worthington Steam Turbine with double extended gear shaft for direct connection into the line shaft of a large paper machine



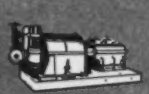
A small Worthington paper machine drive unit for belting to drive shaft

WORTHINGTON

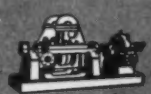
T7-4

A GREAT TEAM IN STEAM

Feed Water Heaters



Multi-Stage Turbines



Boiler Feed Pumps

Turbine-Generator Sets

Single-Stage Turbines

Surface Condensers

Canadian Technical Section

Holds Three-Day Annual Meeting

››› THE RECORD attendance, the evident interest in the papers presented and subjects discussed, the presentation of a program of interest to management, operators, research, and technical personnel alike characterized the thirty-fourth annual meeting of the Technical Section of the Canadian Pulp and Paper Association held on January 28, 29 and 30, 1948, in the Mount Royal Hotel, Montreal, Quebec.

Through the well diversified program of papers and informal group discussion periods, and through the media of intimate personal contacts of the delegates, ample opportunity for the interchange of ideas was afforded those in attendance. The evident enthusiasm with which the delegates discussed each of the papers presented and the keen interest evinced in the subjects discussed at the informal discussion sessions emphasize the value of such conventions to the industry. At the seven formal sessions scheduled, a total of twenty-three papers were presented. In addition to the formal papers, fourteen informal group discussion periods were programmed.

A plant visit sponsored by the Heat and Power Committee to see a velocity steam installation marked a new departure in that it was the first such visit conducted at these meetings. Another new procedure adopted at this convention was the presentation of short prepared discussions of the great majority of formal papers by men intimately associated with the fields concerned. These prepared discussions not only provided additional information for the audience, but also added to the lively open discussions of the papers.

The ever-increasing number of foreign delegates to the meeting demonstrated the ever-widening international scope of these meetings. Not only was all of Canada, Newfoundland, and the United States well represented but also this year more delegates were welcomed from other countries such as, the Scandinavian countries, Switzerland, China, and India than in former years.

At the Technical Section Business Luncheon held on the second day of the convention reports covering the activities of the Section in 1947 were presented by some of the Section's executives. At this function the election of officers and the presentation of awards to some of the members took place.

Douglas Jones Records Banner Year

"It is obvious that with the growth of the membership, the live and active committees and branches, that we are capable of co-operatively accomplishing much through this association, for ourselves and the industry," said Douglas Jones, secretary-engineer of the Section, in presenting his report. Mr. Jones related in part: that 159 new members were admitted during 1947; that the active membership as of December 31, 1947, was 927; that five members were lost during the year through death; namely, TAPPI President Worthen E. Brawn, Clarry Reaper, John Traquair, Roy Piper, and George Carruthers, an honorary life member of the Section; that a very successful summer meeting was held at St. Andrews-by-the Sea, N. B., when the then Chaleur Branch (now known as the Maritime-Newfoundland Branch) acted as host; that at the official luncheon held during the summer meeting Dr. Milton Gregg, who was then President of the University of New Brunswick, addressed the delegates; that F. L. Mitchell, manager of the Canadian Pulp and Paper Association, was the speaker at the official dinner programmed during the summer meeting; that at the latter function Professor H. O. Keay was elected to honorary life membership in the Section; that an official visit to Newfoundland was made following the summer meeting by representatives from the Technical Section, the Association and the Pulp and Paper Research Institute of Canada.

R. J. Askin, retiring chairman of the Technical Section

The secretary-engineer, in reviewing the activities of the Section's six branches during 1947, reported that the Chaleur Branch had expanded its orbit to include the mills in Newfoundland and Nova Scotia and had changed its name to "Maritime-Newfoundland Branch"; that several subbranches which hold meetings monthly have been formed at some of the more remote mills; that the total membership of the branches is 991; that the executive of the Maritime-Newfoundland Branch formed a committee on education, this committee to work in close liaison with the Maritime mills and universities on the subject of training, summer employment, etc.

In highlighting the efforts of each committee of the Technical Section during 1947, Mr. Jones reported:

The Alkaline Pulping Committee has maintained close liaison with the Pulp and Paper Research Institute of Canada in regard to the alkaline pulping research program, and has carried out a survey of kraft mill maintenance costs, a survey in which all Canadian alkaline pulp mills co-operated.

The Board Committee, together with its sub-committees, has worked on the compilation of the information obtained in reply to the "Board Drying" questionnaire circulated to all mills, and has developed the oil absorbency tester, the Howard Smith board creaser and the Durgin board folding tester. (In connection with its portion of the convention program, the committee demonstrated these three testers during the course of the meeting.)

The Engineering Committee, for various reasons, was inactive during 1947 but has been reorganized for 1948. The committee was wished success in its endeavors.

The Engineering Data Sheet Committee has commenced to review and revise the data sheets contained in the

bound volume which is now out of print.

The Fine Papers Committee, with the co-operation of manufacturers, is carrying out a mill-scale study of dirt removal equipment at the Beauharnois mill of the Howard Smith Paper Mills Limited and plans to study the relative efficiencies of stock consistency regulators. The committee has made a review of new developments in equipment, etc., used by the fine paper mills.

Above—Technical Section Registration

Center—Heat and Power Group hearing papers on suction rolls, Sulzer blowers, and infrared drying

Below—Newsprint Group hearing papers on slime control, proportioning slush pulp, and headbox design

The Heat and Power Committee has studied the following subjects:

(1) Bark disposal
(2) Paper drying and ventilation
(3) Unit sub-stations for power distribution
(4) Infrared drying
(5) Heat pumps and multiple effect paper drying
(6) Suction rolls and vacuum requirements

The Mechanical Pulping Committee has continued to work in close liaison with the Research Institute in connection with projects suggested by the committee, and has made a study of the effect of groundwood fines on the quality of newsprint paper.

The Newsprint Committee has devoted its time to a study of the double suction couch, to compilation of informative papers relating to newsprint operation and to analyzing the returns to the slime control questionnaire. In commenting on the session for practical papermakers sponsored by this committee at the summer meeting Mr. Jones said, "This session on the practical aspect of headbox design for news machines at higher speeds was planned by two superintendent members of the committee. The session was well attended and the discussion between some of the older operators was very lively. Younger members of the Section were well repaid by attending. Based on the discussion mentioned, one of the committee members wrote the paper presented at one of yesterday afternoon's (Wednesday) sessions."

The Physical and Chemical Standards Committee has continued its study of existing and new standards, has had three new standards printed and has authorized the printing of seven others. The committee has requested the assistance of the branches in compiling rapid mill tests.

The Printability Committee was disbanded and the Board, Fine Papers and Newsprint Committees have been requested to take over this activity as it applies to their individual spheres. Mr. S. M. Chapman has again prepared his annual review of the literature on printability and allied subjects.

The Process Instrumentation Committee formed during 1947 "has made a very auspicious start." A monthly

column in the *Pulp and Paper Magazine of Canada* edited by two members of the committee has been in operation for some months and a sub-committee of all instrument suppliers has been formed. In 1948 the committee will undertake a survey of instrumentation in the mills and will sponsor a training course in instrumentation for engineers of the industry.

The Sulphite Committee completed and submitted for printing two reports, namely, "Bleached Sulphite Pulp for Paper" and "Drying of Sulphite Pulp." A report entitled "New Developments in the Sulphite Industry" has been prepared for publication in the January issue of the *Pulp and Paper Magazine of Canada*. A project for a study of the effect of all variables on the sulphite process has been submitted to the Research Institute and approved.

The Waste Committee has devoted considerable time to the revising and editing of its report entitled "Reduction and Utilization of Wood Waste." This report will be published during 1948.

The Wood Chemistry Committee has continued to study new developments in the field of wood chemistry and to promote and actively assist research into various problems of interest to the industry and has maintained close contact with the work now being carried out in the Division of Industrial and Cellulose Chemistry under Dr. C. B. Purves as well as certain projects being investigated by the Research Institute staff.

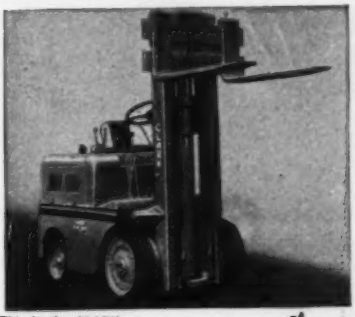
In remarking on the close liaison maintained between the Research Institute and the Technical Section Mr. Jones said, "With the addition of several new staff members and more money available for research, the value of the Research Institute is being more and more appreciated, particularly by the Technical Section. Staff members are actively connected with a number of the Section's committees and many items of program have emanated from the Technical Section." Among the items on the Institute's program which were suggested by the Section are: the alkaline, groundwood and sulphite pulping studies; a study suggested by the Board Committee pertaining to the relationship of the surface oil absorbency test to the gloss ink printing of paperboard; the development of the electronic dirt count apparatus and the analysis of waste sulphite liquor (Dr. Yorston recently published an excellent article on this subject). In addition, the Institute underwrote the development costs of the two board testers developed by the Board Committee.

MATERIAL HANDLING *News*

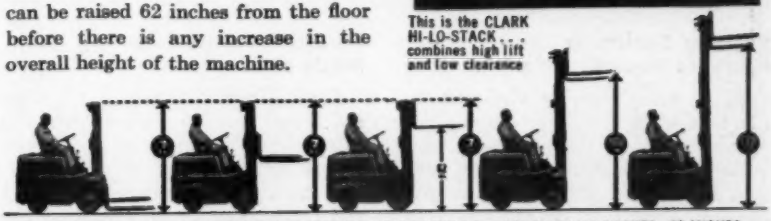
With this high-lift, low-clearance attachment, a Clark fork truck can take material through a freight car door and tier loads to the car roof, as well as tier loads rafter-high in the warehouse.

TIERING HEIGHT 130″ COLLAPSED HEIGHT 83″ FREE LIFT 62″

That "free lift 62 inches" is the vital specification of HI-LO-STACK, Clark's new high-lift, low-clearance attachment. It means that the forks can be raised 62 inches from the floor before there is any increase in the overall height of the machine.



This is the CLARK HI-LO-STACK . . . combines high lift and low clearance



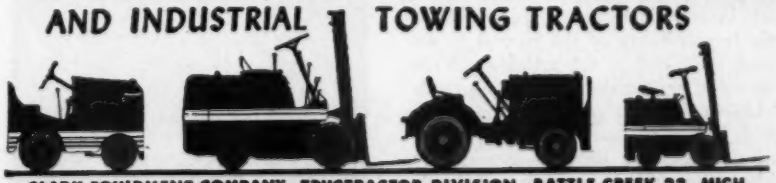
83 INCHES OVERALL HEIGHT. FORKS LOWERED | NO CHANGE IN OVERALL HEIGHT WITH "FREE-LIFT" OF FORKS UP TO 62 INCHES | UP-UP-TO 130 INCHES—22 INCHES ADDITIONAL LIFT FOR EXTRA HIGH TIERING

You recognize instantly the practical benefits of the HI-LO-STACK—it enables a fork truck to take a load through the 7-foot door of a box-car and tier loads to the roof of the car, or to tier unit loads to the rafters in the warehouse. Heretofore, with conventional lift mechanisms, the increasing height of the vehicle made it impossible for the same machine to perform all these operations; making it necessary, in many handling operations, to use two machines—one for loading and unloading cars and another for high tiering in the warehouse.

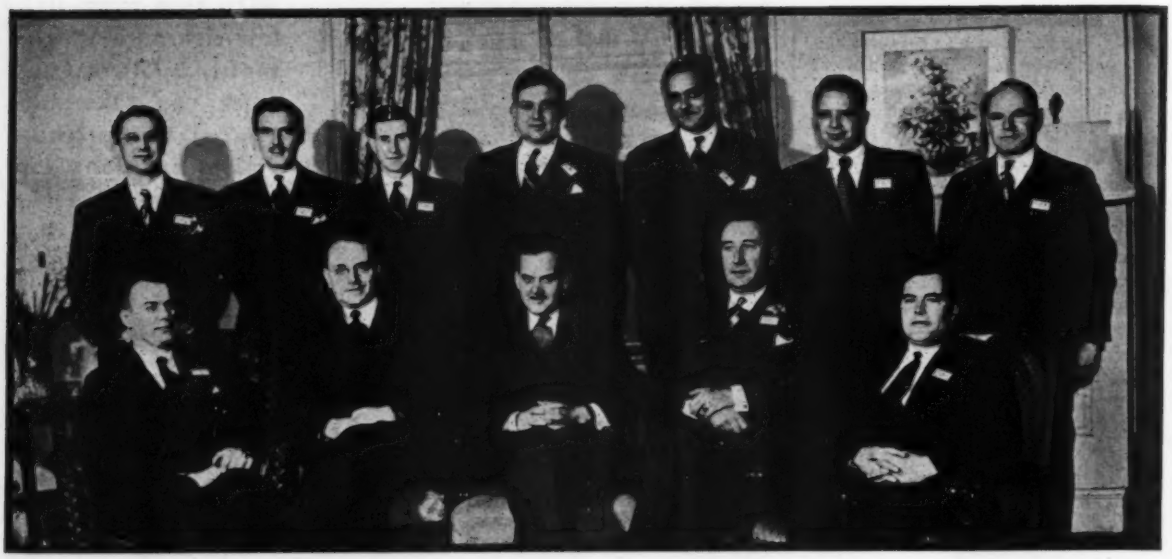
Also HI-LO-STACK is an exceedingly simple mechanism. It has only one lift cylinder, and a single set of uprights with slide members inside. Lifting is accomplished with unusually low hydraulic pressure, which minimizes possibility of leakage.

It adds up that HI-LO-STACK is a typical Clark development—sturdily built, simple as can be, a thoroughly dependable unit; a good example of the sound engineering and incomparably rich knowledge of handling operations for which Industry looks to Clark. Write for particulars.

CLARK GAS AND ELECTRIC POWERED **FORK TRUCKS**
AND INDUSTRIAL TOWING TRACTORS



CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 22, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD



Retiring Technical Section Council and 1948 members of the Council. Standing (L to R)—Douglas Jones, secretary-engineer; B. W. Burgess, technical assistant; G. A. Franklin, W. C. R. Jones, E. G. Kirby, Dr. J. Edwards, John Buss. Sitting—A. J. Phillip (retiring councillor), R. J. Askin (retiring chairman), F. J. Giffen (newly-elected chairman), C. D. Jentz (retiring councillor), and C. E. Turner

Retiring Chairman Presents Report

R. J. Askin, retiring chairman of the Section, when reporting on the progress made in the past year, said, "The Technical Section of the Canadian Pulp and Paper Association was formed during the first world war to stimulate interest in the science of pulp and papermaking in Canada, to provide means for the interchange of ideas among its members, and to encourage original investigation." It has today the largest membership on record—nearly 1000 members—a net gain during the year of approximately 130 new members.

Reference was made to the success of the 1947 summer meeting, to the official visit to Newfoundland, to the activities of the newly formed Process Instrumentation Committee and the other committees of the Section, and to the growth of the branches. With reference to the latter, Mr. Askin said, "You can appreciate the significance of this development (growth) when I tell you that nearly 75 per cent of the branch membership are not members of the Technical Section, and of those, nearly 44 per cent hold the rank of foreman or lower. These facts indicate the interest of those in our industry in technical matters and increase the responsibility of the Section to see that their desires are satisfied. With increased registration the Section tends unfortunately to get more impersonal and hence the advantage of active committee work becomes increasingly important and the growth and development of the branches becomes urgent."

Award Presentations Made at Luncheon

E. G. Kirby, chairman of the 1946 and 1947 Sulphite Committees, was awarded the Technical Section Service Award for his outstanding contribution towards the work of the Section and the welfare of the industry. The award was presented by R. L. Weldon of Bathurst Power and Paper Co., Ltd.

For his paper entitled "The Effect of Certain Variables in the Bleaching of Groundwood with Sodium Peroxide" and judged the best paper presented by a junior member at the 1947 annual meeting, W. E. Stobo received the C. Howard Smith Gold Medal, donated and presented by Harold Crabtree of Howard Smith Paper Mills Limited.

F. J. Giffen, chairman of the Technical Section for 1948

The I. H. Weldon Gold Medal was presented to G. H. Tomlinson, G. H. Tomlinson II, J. N. Swartz, J. H. Robertson and H. D. Orloff by A. L. Dawe, the donor of the medal. This medal was awarded to these members in recognition of the fact that their paper entitled "Improved Heat and Chemical Recovery in the Alkaline Pulping Processes" was judged the best paper presented at 1947 annual meeting.

Technical Section Officers for 1948

F. J. Giffen, assistant to the manager of manufacturing, Newsprint Division, Canadian International Paper Company, was elected chairman of the Section for 1948 at the business luncheon. At the same function the following members were elected as councillors for a three year term:

Dr. J. Edwards, Price Bros. & Co. Ltd., Kenogami, Quebec.
W. C. R. Jones, Howard Smith Paper Mills Ltd., Beauharnois, P. Q.
E. G. Kirby, Price and Pierce Limited, Montreal.

Formal Papers Presented

A list of the formal papers presented at the meeting together with the names of the authors of the papers and the prepared discussions follow:

Suction Rolls and Vacuum Requirements—A Rational Approach, E. T. Buchanan, Consolidated Paper Corp. Limited. Discussions prepared by: Dr. W. Boyd Campbell, Pulp & Paper Research Institute of Canada; D. L. Dowling, Roots-Connersville Blower Corp.;

H. E. Adams, Nash Engineering Co., and F. A. Garrett, Canadian International Paper Co. Ltd.

The Use of Sulzer Blowers in the Paper Industry, Robert Thomann, Sulzer Bros. Limited, Winterthur, Switzerland. Discussions prepared by: D. L. Dowling, Roots-Connersville Blower Corp., and H. E. Adams, Nash Engineering Co.

Considerations of Radiant Energy in Moisture Removal, I. J. Barber, Fostoria Pressed Steel Corp.

Widening Uses for Wood Waste, T. A. McElhanney, Forest Products Laboratories, Ottawa, Ont. Discussion prepared by Dr. J. K. Russell, Northeastern Paper Products Ltd.

The Longitudinal Grinding of Wood —Further Work, W. H. de Montmorency, Pulp and Paper Research Institute of Canada. Discussion prepared by Dr. J. Edwards, Price Bros. and Co. Ltd.

Organizing and Training an Instrument Department, J. W. Graeb, Imperial Oil Limited, Sarnia, Ont. Discussion prepared by J. N. Franklin, Bowater's Pulp & Paper Mills Limited.

By-Products from the Kraft Pulping of Pine Woods, Dr. Otto Kress, The Institute of Paper Chemistry, Appleton, Wisconsin (read by K. C. Logan, Pulp & Paper Research Institute of Canada). Discussion prepared by Dr. E. C. Jahn, N. Y. State College of Forestry.

Alkaline Pulping—Spruce, John S. Hart, Pulp & Paper Research Institute of Canada. Discussion prepared by John Grieve, Brown Corporation.

The Lime Manufacturing Process, Victor J. Azbe, Azbe Corporation. Discussion prepared by G. F. Allo, Bathurst Power & Paper Co. Ltd.

Slime Control at Anglo-Canadian Pulp & Paper Mills Ltd., 1947, E. L. Neal and S. F. Jennings, Anglo-Canadian Pulp & Paper Mills Ltd. Discussion led by H. R. Davidson, The Great Lakes Paper Co. Ltd., Chairman of the Newsprint Sub-committee on Slime.

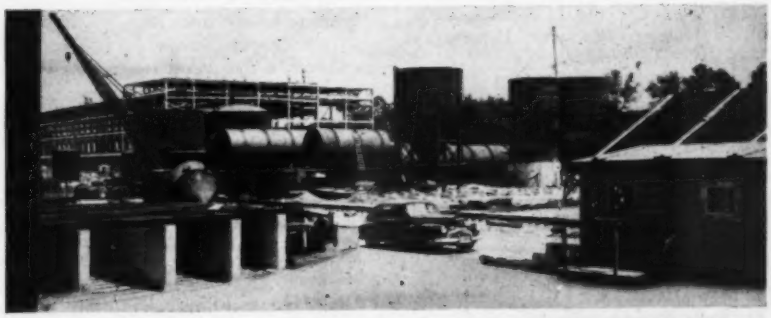
A New Method of Proportioning Slush Pulp, R. M. Bishop, Anglo-Canadian Pulp & Paper Mills Ltd. Discussion prepared by D. Zimmerman, Fischer & Porter Co. Ltd.

Current and Contemplated Design of Headboxes for Newsprint Operation, R. L. Fraser, Ste. Anne Paper Co. Ltd.

Standardization of the Bendtsen Tester for Measurement of Roughness of Newsprint Paper, Dr. C. A. Sankey, The Ontario Paper Co. Ltd., and P. H. White, A. C. Wickman (Canada) Ltd. Discussion prepared by S. M. Chapman, Pulp & Paper Research Institute of Canada.

Ingalls structural steel and platework is used in the new plant of the Southern Paperboard Division of Robert Gair, Savannah, Ga., shown in these views.

If you are planning construction of a new plant, or additions to your present one, it will pay you to figure with Ingalls first. Ingalls has had many years of experience in fabricating structural steel, bins, hoppers, stills and other receptacles of every type for the specialized needs of the paper industry. The Ingalls name guarantees your steelwork to be satisfactory, economical, long lasting; our four complete fabricating plants assure you prompt service. Complete erection facilities provided, if desired. Write our Birmingham office for further information.



INGALLS STEEL

THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Offices at BIRMINGHAM, New York, Pittsburgh and New Orleans. Fabricating plants at Birmingham, North Birmingham, Verona, Pa., and Pascagoula, Miss.

The Rheology of Paper—A New Approach to the Study of Paper Strength, Dr. S. G. Mason, Pulp & Paper Research Institute of Canada. Discussion prepared by Dr. B. Steenburg, Svenska Traforskningsinstitutet, and Dr. W. Gallay, The E. B. Eddy Company.

The Place of Industrial Statistics in the Manufacture of Pulp and Paper, C. A. Bicking, Hercules Powder Co. Discussion prepared by W. E. Patte, The E. B. Eddy Company.

The Analysis of Sulphite Waste Liquor (by title), Dr. F. H. Yorston, Pulp & Paper Research Institute of Canada.

Trends in Industrial Relations in the Fine Paper Industry, D. O. McLennan, The E. B. Eddy Company. Discussion prepared by D. Ross-Ross, Howard Smith Paper Mills Limited.

The Collection and Use of Daily Production Statistical Information, C. R. Tait and J. C. Wilson, Hammermill Paper Co. Presented by Walter Hendrich, Hammermill Paper Co. Discussion prepared by A. E. H. Fair, Alliance Paper Mills Limited.

Cost Responsibility—Principles and Practices, Paul Kellogg, Stevenson & Kellogg Limited. Discussions prepared by A. F. Gurr, Consolidated Paper Corp. Limited, and J. R. Leslie, Howard Smith Paper Mills Ltd.

Abitibi Engineer Training Course, A. R. Mobbs, Abitibi Power & Paper Co. Ltd.

The Use of Lithcote in the Pulp and Paper Industry, Wm. S. Lang, R. F. Walsh Co. Ltd.

The Use of Liquid Sulphur Dioxide for Calcium Bisulphite Acid Production, E. H. Lougheed, Abitibi Power & Paper Co. Ltd. Discussion prepared by Vance P. Edwardes, International Paper Company.

Neutral Sulphite Pulping of Wood, G. H. Chidester and J. N. McGovern, U. S. Forest Products Laboratory, Madison, Wis.

Lively discussions followed the presentation of each of the above papers. The prepared discussions of the papers and the authors' replies to these discussions added to the information provided those in attendance and tended to encourage the open informal discussions of the papers.

Group Discussion Periods Programmed

The Alkaline Pulping Committee devoted two sessions to informal discussions. At the first session, lime burning systems were discussed, the discussion being led by Victor J. Azbe, Azbe Corporation, St. Louis, Missouri, and representatives from mills which

Douglas Jones, secretary-engineer of the Technical Section of the Canadian Pulp and Paper Association

presently reburn lime. A discussion, led by John Hart, of the alkaline pulping research program at the Pulp and Paper Research Institute of Canada, together with a discussion of the alkaline pulping monograph presently under preparation, constituted the second session. The discussion of the monograph was led by Dr. J. H. Ross, Pulp & Paper Research Institute of Canada.

Two informal papers—"Multiple-Generator Power for Sectional Paper Machine Drives" by L. K. Hart, Canadian General Electric Co., Ltd., and G. E. Plaisted, General Electric Company; and "Disposal of Wood Refuse at Thunder Bay Paper Co., Ltd., by T. C. Anderson, Thunder Bay Paper Co., Ltd.—Formed the basis for the Heat and Power Committee's session, which was under the chairmanship of E. T. Buchanan, Consolidated Paper Corp. Limited. Each of these papers was followed by interesting and lively discussion. In addition to this group discussion session, this committee sponsored a visit to a velocity steam installation at Shipping Containers Limited, Montreal. This visit was the first of its kind programmed during an annual meeting and proved to be an interesting innovation.

"Gloss Ink Printing of Paperboard" was the subject of the first informal session of the Board Committee which is under the chairmanship of D. R. Dick, Howard Smith Paper Mills Limited, Cornwall, Ontario. H. E. Ransom, Ault and Wiborg Co. Canada Ltd., led the discussion of this subject. At this function, the new tester designed by the Committee for the determination of the oil resistance of the surface of paperboard was demonstrated. The second group discussion period sponsored by this committee was devoted to the discussion of two topics—the first, "Board Machine Felts," was led by A. V. Wright, Kenwood Mills Limited, Arnprior, Ontario; the second, "Drying of Paperboard," was based on replies to the board drying questionnaire distributed by the committee. At its third session, the committee demonstrated two new testers developed by the committee for the determination of folding properties of paperboard. These instruments, the Howard Smith board creaser and the Durgin board folding tester, were discussed from the following aspects: (a) design, (b) engineering and (c) use in control testing.

As a result of the excellent response to the practical discussion of headbox design for newsprint operation programmed at the 1947 summer meeting, the Newsprint Committee decided to devote its group discussion period to a similar type of meeting, this one for the purpose of discussing the practical aspects of newsprint machine design with particular reference to the machine wet end. Messrs. L. Coccoran, Anglo-Canadian Pulp and Paper Mills Limited, and F. A. Lavallee, Abitibi Power & Paper Co. Ltd., again led the session in the same manner as they did during the discussion at the summer meeting.

The Fine Paper Committee, with W. C. R. Jones as chairman, discussed new developments in the fine paper industry. Among the subjects discussed were the following:

Wood Pulp—cleanliness, quality, handling and refining

Rag Pulp—quality, treatment

High speed washers for rag stock, Dirtex, Vortrap, screens, etc.

Chemicals—wet strength, foam killers, etc.

Paper machines—headbox perforated distributing rolls, slices, suction boxes, vacuum controls, dandy roll coverings and drives, suction presses, triplex pumps, vapor extraction rolls, break indicators, air dryers and basis weight controls.

Finishing—sorting machines, mechanical handling equipment, etc.

The Waste session took the form of a round table discussion of methods of recovery of fiber from white water. W. M. Orchard, The Ontario Paper Co. Ltd.; S. Richardson, The E. B. Eddy Co., and C. L. Tomlinson, Howard Smith Paper Mills Ltd., led the discussion of this subject.

At the opening of the Standards session, Dr. C. A. Sankey, The Ontario Paper Co. Ltd., demonstrated the Bendtsen roughness tester. This demonstration was followed by an informal paper presented by Dr. James d'A. Clark entitled "The Rational Evalua-

STOP! THIEF!

Your fireman would not think of taking coal from your mill to heat his own home. But when he is obliged to feed enough coal into the stoker to enable the driers to remove water that should have been pressed out at the couch, your loss is just as great.

Equip your machine with correctly specified Hamilton Felts and SAVE COAL. When the sheet has passed through the press on a Hamilton Felt there is so little water left in it that less steam is required to evaporate the remainder at the driers—less fuel consumed under the boiler—machine speed may be increased—broke is reduced to minimum.

• From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster, and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

tion of Pulps." This paper proved to be of considerable interest and evoked a lively and interesting discussion.

The newly-formed Process Instrumentation Committee discussed the important subject of training of instrument department personnel at its group discussion period. J. N. Franklin, of Bowater's Newfoundland Pulp and Paper Mills Ltd. and chairman of the committee, directed the discussion.

An informal paper by W. T. Butler, Abitibi Power & Paper Co. Ltd., entitled "The Use of the Bauer-McNett Fibre Classifier" was the basis for the first part of the program for the Mechanical Pulping session. Some time was also devoted to a discussion of the proposed questionnaire on groundwood mill maintenance costs.

Two informal papers were presented during the Wood Chemistry session. The first, by Dr. E. C. Jahn, New York State College of Forestry, was entitled "Chemical Production from Pulp Mill By-Products in Scandinavia." "A Review of Factors Determining Relative Strengths of Sulphate and Sulphite Pulp" was the title of the paper which was also included in the program for this session and was presented by K. C. Logan, Pulp and Paper Research Institute of Canada. Following a short introduction by Dr. C. B. Purves, three short talks were given by three students as follows:

L. G. Neubauer—"Extraction of Maple Wood with Liquid Ammonia"

Dr. C. Schuerch—"Experiments with Spruce Periodate Lignin"

C. D. Logan—"Reduction of Chlorine Dioxide by Hydroquinone"

"Industrial Training" was the subject of the Sulphite session, which was under the chairmanship of E. G. Kirby, Price & Pierce Limited. Two informal papers were presented during the course of this session, one by H. R. Filiatrault of Canadian Industrial Trainers' Association, the other by Dr. Edward C. Webster, consulting psychologist, McGill University.

In all the informal discussion meetings and after every formal paper programmed during this annual meeting of the Technical Section, Canadian Pulp and Paper Association, lively and informative discussions occurred. This evident interest marks another successful Technical Section meeting.

Canadian P. and P. Association Holds Council Meeting and Annual Luncheon

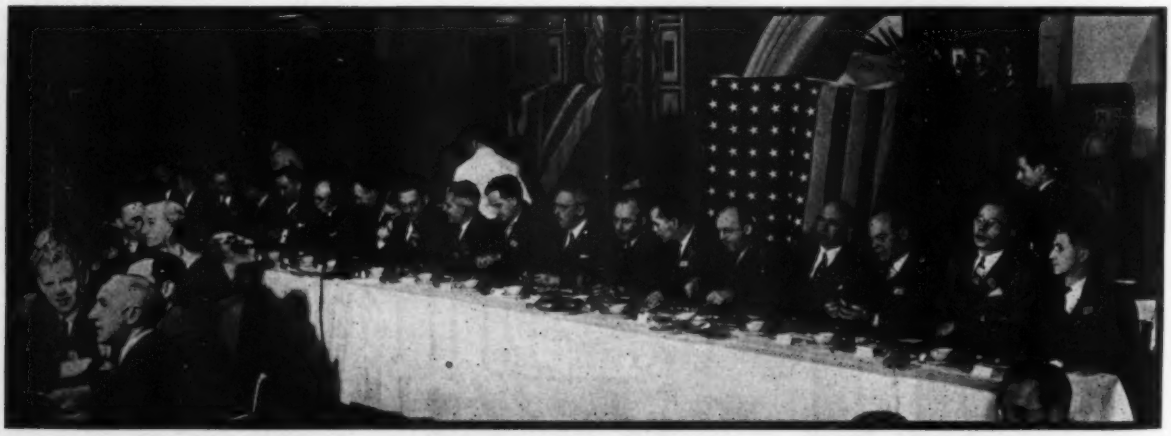
▶▶▶ DURING THE COURSE OF the three-day convention of the Technical Section, the Canadian Pulp and Paper Association held its annual council meeting and its annual luncheon. Concurrent with the other functions held during the convention, the various chairmen of the sections of the Association reported briefly on the activities of their groups during 1947.

President Fowler Speaks at Luncheon

At the annual luncheon of the Association, President R. M. Fowler presented his annual report.

In speaking of the understanding and agreement on basic objectives between employers, labor and governments, Mr. Fowler said, "In Canada, as an eminent historian recently stated, 'a working harmony between large scale enterprise and the federal and provincial governments has been almost a historical necessity in the development of the Canadian economy.' I do not mean that there is not room for argument and disagreement on detail, but I think it is true to say that in this pulp and paper industry there is a large measure of agreement on basic objectives and a willingness to co-operate between management, labor, and Canadian governments—both federal and provincial.

"This community of thinking is no better illustrated anywhere than in the realm of forest policy. The pulp and paper industry has declared its forest policy, a policy of operating forest holdings on a perpetual yield basis. Let me read you two sentences from two recent statements: 'The aim of our public policy is to maintain and improve forest resources for the advantage of the whole of the people and for an unlimited period of time.' The second statement reads: 'We do not intend to permit, now or at any time in the future, an annual cut in excess of the actual growth which assures perpetuity of our forest stands.' One statement was made recently by the Prime Minister of Quebec, the other by the Prime Minister of Ontario. Either, or both, could have been made by a representative of the pulp and paper industry. There is no difference of opinion on the fundamentals of this great question and there is every reason to believe that governments and industry can co-operate to achieve their common objective in forest policy.



Speakers table at the Technical Section Luncheon. The Section's service award and the Weldon Gold Medal were presented at the luncheon

"There is much to be done. This industry is working and will continue to work toward the goals of perpetual yield, sound forest management, greater protection against fire, insects and disease, more complete utilization of raw materials and the elimination of waste. It is not a policy that can be implemented once and for all and by some spectacular action. It must consist of a great number of different actions and must receive continuous attention from woods operators and government agencies alike. The pulp and paper industry is pouring back into the forests a large proportion of its expanded receipts of recent years to make good the deficiencies of forest policy during the years of depression and war and to ensure adequate supplies of pulpwood for the future. In the long run these great expenditures will give valuable returns to the industry, to its employees, to government, and to the customers who depend upon Canada for their supplies."

The speaker, when stressing the need for co-operation between the pulp and paper industry and by the government and the necessary expansion of exports, said, "On the more positive side of expanding exports, it is safe to say that the pulp and paper industry can and will do much. Much has already been done. In 1947 Canadian newsprint production totalled 4,447,000 tons, an increase of more than 300,000 tons over the previous peak year in 1946, and an increase of more than 47 per cent over the prewar average for 1935-39. While Canadian newsprint consumers received slightly more than their proportionate share of the increased tonnage, the great volume of the increase went to the United States, which received 330,000 tons more in 1947 than in 1946. In fact, during the newsprint meetings in Toronto early last October we estimated that the United States would receive 3,581,000 tons of newsprint from Canada in 1947, and we now find that we were 104,000 tons too conservative in our estimates. Thus, in the year, by increased efficiency and speeds, without the addition of new machines, we were able to add to United States supply the eequivalent of more than the output of three new newsprint mills similar to that now under construction in Alabama. In fact, since October we have added the equivalent of one such mill's output to the amount we have expected to supply. This, incidentally, is the industry that was accused of conspiring to restrain the supply of newsprint to the United States.

"The story in pulps is equally good. Domestic pulp supplies were materially

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Here's the answer to tramp iron problems! This *powerful* electromagnet, installed in pulp lines, prevents tramp iron damage to pumps, jordans, screens or other equipment—before it causes costly shutdowns. Dings double gap design produces a deeply penetrating and evenly distributed magnetic field—most powerful magnet available for the job . . . it's a real tramp iron barrier. Simple to install . . . low operating cost . . . negligible maintenance because of no moving parts . . . powerful magnet coils enclosed in waterproof case , . . available in various sizes. These magnets are installed face up in the pulp lines with the pipe flared out across the magnet face and an access plate provided to permit easy removal of accumulated iron. If tramp iron is a problem in your mill, write to Dings today.

Outstanding Features:

- **High intensity double gap magnet field — deep penetration; no "dead spots"**
- **Easy to install**
- **Negligible current consumption**
- **Trouble-free. No moving parts to get out of order**
- **Waterproof case**

Typical Examples of What These Magnets Can Do For You!

- **A large southern pulp mill** was losing an average of two pump impellers per week prior to installing Dings rectangular magnets—causing big losses in time and tonnage due to shutdowns. Since using Dings magnets, not one pulp impeller has been destroyed or any production time lost due to tramp iron getting into pumps or other machinery.
- **Paper company** removes 60 to 70 lbs. of tramp iron every 24 hours!

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Separation Headquarters Since 1899

DINGS MAGNETIC SEPARATOR CO., 4762 W. McGeogh Ave., Milwaukee 14, Wis.

increased during the year. We estimate that pulp exports, mainly to the United States, increased by 265,000 tons in 1947 over 1946.

"This increase has been an important factor in maintaining a very high level of paper and paperboard production in the United States and bringing their pulp supplies into closer balance with the demand.

"We can expect the expansion of exports of both newsprint and pulp to continue in 1948 and this should materially aid in increasing the supply of American dollars that Canada so urgently needs. However, in other lines of pulp and paper products, the possibilities have been scarcely explored. During 1948 it may be necessary for all other branches of the industry—fine papers, wrapping and kraft papers, specialties, paperboard—to re-examine their whole situation, and to re-orient their development and merchandising. This necessity will not spring from any temporary theory of government but from the cold, and permanent logic of the facts of world trade."

Mr. Fowler spoke of the inadequacy of present pulp and paper research facilities in Canada and expressed the hope, "that we can move quickly to a development of more extensive fundamental research, and follow it by great increased application to practical results in the individual mills."

"Increases in prices, there were in 1947. There were also increases in the numbers employed—in the rates of wages paid—in the bills for transportation, food, chemicals, fodder and other goods and services. Unfortunately, it is too early in the year to have the figures from the Dominion Bureau of Statistics showing the expenditures of the industry in 1947. . . .

"Without being able to have final figures for the year or figures from all companies, I wanted to get a representative picture of what happened to the dollars received by this industry in 1947. I wanted to find out if there was any truth in the popular belief that the pulp and paper industry is 'rolling in money,' that its profits are exorbitant, and that it has pushed up its prices to unjustifiable levels. Much of the loose thinking on the subject is, I believe, based on an unfair comparison between the present and the prewar period, when the industry was affected by depression and bankruptcy. It is somewhat like comparing a man who used to be on relief and who now has a respectable job at a decent salary and is trying to pay off his old medical and grocery bills.

"To try to discover what was the true situation of the industry in 1947, I asked twelve companies about three

L. J. Belnap, 1948 chairman of executive board of Canadian Pulp and Paper Association

weeks ago to give me a confidential breakdown of their income dollars in 1947. The companies were selected more or less at random . . . (but) the twelve companies manufactured all kinds of products—pulps, newsprint, paperboard, fine papers, wrapping papers—and the tonnages they produced totalled nearly 60 per cent of the total industry production. . . .

"Out of each dollar received by these twelve companies in the first ten or eleven months of 1947, 19.2 cents went to direct labor in the mills and offices, 28.5 cents went to provide wood. The figure of wood cost includes, of course, a heavy element of woods labor, probably at least two-thirds; so it is fair to say that labor employed directly in the industry in the mills and woods received over 38 cents of every dollar that came in. Other materials required in manufacture accounted for 15.5 cents; power and fuel cost 7.9 cents. Taxes paid to federal, provincial and municipal governments (but not including stumpage dues and other governmental payments included in wood costs) received 12 cents out of each dollar. Depreciation of plant and machinery required 4.8 cents and bond interest 1.5 cents. This left 3.9 cents paid out as dividends to shareholders and 6.7 cents held in company funds as a so-called 'surplus.'

"I would like to say a word about this surplus account, as there is probably no part of corporate accounting more likely to be misunderstood. . . . It is money that is voluntarily left in the business by the shareholders to keep it running and financially sound. It helps to provide the working capital from which wages are paid and materials are purchased before payment is received from customers for goods that have been manufactured and sold. Today when payrolls and the costs of everything the companies must buy are soaring, there is need of much more working capital than formerly and it would be a foolish management that did not provide during a period of maximum production and high demand such an insurance fund against possible business recessions. . . .

"The most significant figure, of course, is the dividend figure. In a year when production was at the highest level of history, when every mill operated at or above its capacity but was still unable to satisfy the demand, the shareholders who put up the money to build this industry received 3.9 cents out of the income dollar. As it takes more than a year to turn over the capital invested, it is safe to say that such a figure represents less than 3 per cent on the capital invested. Those same shareholders had come through more than fifteen years of depression and war restrictions when dividends were low and often nonexistent. In 1947, producers in other countries were demanding and receiving much higher prices than Canadian producers sought. Can anyone say that this figure of 3.9 cents out of the sales dollar paid in dividends is unreasonable by any conceivable test or standard? Is this profiteering? Are the prices that produce such a result unreasonable or exorbitant? Can the employees who received ten times as much as the shareholders did complain of unfair treatment? I suggest to you that this is a good record showing wise stewardship and commendable self-restraint in merchandising."

At this same luncheon, W. H. Howard, C.B.E., K.C., formerly co-ordinator of the Pulp and Paper Products Administration of the Wartime Prices and Trade Board, was awarded a medal in recognition of services rendered the industry during his tenure of this office.

The immediate past chairman of the executive board of the Canadian Pulp and Paper Association, Aubrey Crabtree, presented a medal to the 1947 chairman, S. L. de Carteret, C.M.G., for his untiring efforts on behalf of the Association.

Executive Board Officers of the Canadian P. and P. Association

The Canadian Pulp and Paper Association announced the following officers for its executive board for 1948:

Chairman—L. J. Belnap, chairman of the board, Consolidated Paper Corporation Limited.

Vice-Chairmen—S. L. de Carteret, C.M.G., president, Canadian International Paper Company; Aubrey Crab-

Know Your E-P Man

WHO HE IS—One of the materials handling engineers from the nearest of Elwell-Parker's 34 field headquarters—a specialist with many years' experience in industrial truck systems.

WHAT'S BEHIND HIM—Elwell-Parker's *longer* and *more varied* experience gained by 42 years' service to more than 300 branches of industry.

WHAT HE CAN DO FOR YOU—**1.** Analyze *your* materials handling problem—that is, *your* loads in relation to *your* plant and production system. **2.** Suggest the correct basic containers for your products, and their proper handling in master unit loads. **3.** Recommend an integrated system of Elwell-Parker Trucks, Tractors and Cranes selected from the 47 E-P models, and then have them "tailored" to *your* specific requirements.

To profit by his successful experience, *have us send him so you can start your planning now.* The Elwell-Parker Electric Co., 4241 St. Clair Avenue, Cleveland 14, Ohio.

SCIENTIFIC MATERIALS HANDLING fully explained in free booklet—ask for "Industrial Logistics".

ELWELL-PARKER

POWER INDUSTRIAL TRUCKS

Established 1893

tree, president and general manager, Fraser Companies Limited.

Honorary Vice-Chairmen—C. R. Whitehead, vice president, Consolidated Paper Corporation Limited; B. R. Cancell, vice president, Powell River Co. Limited, and chairman of the Western Branch of the Canadian Pulp and Paper Association.

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▶▶▶ THE THIRD Instrument Conference and Exhibit will be held at the Philadelphia Convention Hall, September 13-17, 1948. E. Grace, chairman of the committee responsible for all arrangements for the meeting has appointed Hank Cabot, chairman, Press Relations Committee. The conference is sponsored by the Instrument Society of America.

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▶▶▶ ABOUT 200 DELEGATES assembled at Atlanta, Georgia, for the annual meeting of the Southern Pulpwood Conservation Association. Reports were made by J. J. Armstrong of the Union Bag and Paper Company, president of the association; M. J. Malzberger, general manager and forester; J. J. Cruikshank and R. R. Reynolds, forestry experts; and Dean D. J. Weddell of the University of Georgia School of Forestry. The members were told that the southeastern states produced 8,932,000 cords of pulpwood in 1947 and southeastern paper mills consumed all of it.

◆

FIRST 1948 MEETING HELD BY PACIFIC COAST TAPPI

The first 1948 meeting of the Pacific Coast Section of TAPPI was held January 16 at Camas, Washington, with 200 attending.

A panel discussion on "Opportunities Awaiting the Young Technical and Engineering Graduates in the Pacific Coast Pulp and Paper Industry" was introduced by W. R. Barber, technical director of Crown Zellerbach Corporation. W. W. Moyer, director of research for Crown Zellerbach, was moderator. Five subdivisions of the topic were discussed by the following men:

1. *The Importance of Preserving a Perpetual Supply of Wood,* Clarence Richen, chief forester for Crown Zellerbach, and Ed Heacox, chief forester for the Weyerhaeuser Timber Company.

2. *The Importance of a Perpetual Market for Pulp and Paper,* M. E. Kinsey, central chemical laboratory representative for Rayonier, Inc., and R. G. Mispley, of the Crown Zellerbach central research and technical department.

3. *The Industry from the Viewpoint of the Plant Chemical Engineer,* R. I. Thieme, technical director of the Soundview Pulp Company.

4. *The Industry from the Viewpoint of the Plant Mechanical Engineer,* R. P. Wollenberg, Longview Fibre Company.

5. *The Industry from the Viewpoint of Research,* R. S. Hatch, director of research for the Weyerhaeuser pulp division.

Tom Nicholson, of the Simpson Logging Company, entered a paper in the Shibley award competition. It was entitled "Statistical Analysis for Plant Operation."

Sir Herbert Gepp, managing director of Australia Paper Manufacturers, Ltd., was a guest speaker at the banquet. Sir Gepp, who has been touring the States since last summer, spoke on economic developments in Australia. He was introduced by Howard Morgan, manager of the Weyerhaeuser pulp division.

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▶▶▶ AT ITS JANUARY meeting, the Wisconsin Paper Group elected W. L. Thornton, Jr., of Neenah, Wisconsin, as president. Other officers are E. C. Hilfert, of Appleton, vice president, and Leo Schubert, of Neenah, secretary and treasurer. Irwin Pearson, of Neenah, was named executive secretary.

◆

DR. J. C. DEAN ADDRESSES NEW YORK STATE TAPPI GROUP

A dinner meeting was held by the Hudson Valley Chapter of the Empire State Section of TAPPI in the Kingsbury Hotel, Hudson Falls, New York, January 16. The speaker was Dr. John C. Dean, manager of the Chemical Products Division of the Socony-Vacuum Oil Company.

Dr. Dean's subject was "Petroleum Products in the Pulp and Paper Industry." He said that 16,000,000 barrels of lubricating oils and allied products marketed yearly by the petroleum industry. More than 3,000,000 barrels of this goes into the paper industry, thus making a close relationship between the oil and paper industries.

◆

A dinner meeting marked the 25th anniversary of the Connecticut Valley Division of the American Pulp and Paper Mill Superintendents Association. At the session held January 17 in the Sheraton Hotel, Springfield, Mass., Raymond F. Bennett, national president of the Association, spoke on the subject "Sharing Your Knowledge." Seated next Mr. Bennett are (left) A. C. Loomis, secretary-treasurer of the Connecticut Valley Division, and (right) Raymond Winkler, chairman of that Division

COMING EVENTS

Feb. 23-26—Annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

Feb. 23-26—Annual meeting of the Technical Association of the Pulp and Paper Industry, at the Commodore Hotel, New York City.

May 19-21—Annual meeting of the American Pulp and Paper Mill Superintendents Association, at the Roosevelt Hotel, New Orleans, La.

Sept. 13-17—Third Instrument Conference and Exhibit, Philadelphia Convention Hall, Philadelphia, Pa.

Oct. 12-16—Fifth National Chemical Exposition by the Chicago Section of the American Chemical Society, Chicago Coliseum, Chicago.

Oct. 18-22—Thirty-sixth Annual Safety Congress, Chicago (Details later).

STATED MEETINGS

Chicago Professional Paper Group meets the third Monday of each month at the Chicago Bar Association, Chicago, Illinois (except July and August). The March meeting has been changed from the regular date of March 15 to March 22.

SERIES 1 OF TYPICAL JONES-BERTRAMS PATENT BEATER APPLICATIONS

JONES-BERTRAMS PATENT BEATER

in a mill making CARBON TISSUE PAPER

The unbeaten stock, at a freeness of about 700 Canadian standard, is taken down to below 100 Canadian standard in less than 60 minutes.

The JONES-BERTRAMS PATENT BEATER operates on a gross cycle of one hour producing twenty-four batches per day.

Dumping and filling time is two or three minutes.

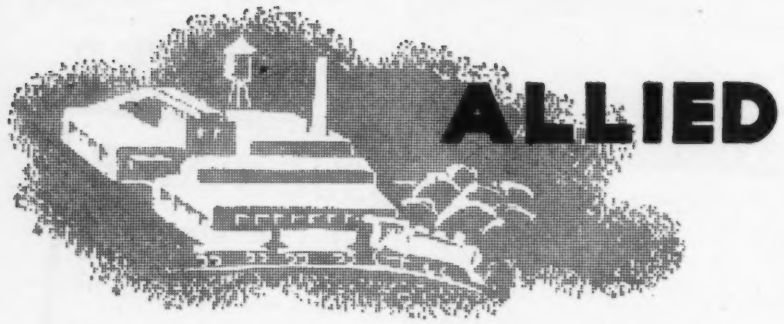
Stock is finally put through only a small high speed 50 HP Jordan as a final control.

More Evidence of PERFORMANCE

Jones

E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.



STEPHEN GOERL ORGANIZES AGENCY FOR PAPER FIELD

A new agency to specialize in the advertising and merchandising of pulp, paper, paper products, and packaging materials has been established by Stephen Goerl, formerly advertising and sales promotion manager of the Bulkley, Dunton Paper Company. Operating under the firm name of Stephen Goerl Associates, the agency is located at 22 East 40th Street, New York.

Prior to joining Bulkley, Dunton five years ago, Mr. Goerl was connected with Young and Rubicam, New York, where he handled a paper product account. He has had close to twenty years' experience in advertising, sales promotion, and public relations.

Stephen Goerl Associates will continue to publish the Pulp and Paper Bulletin for Bulkley, Dunton and act as advertising and merchandising counsel to the organization, including its New England subsidiary, Carter, Rice & Co. Corporation.

◆

LOCKPORT FELT CO. HOLDS ANNUAL SALES CONFERENCE

The second annual sales conference of the Lockport Felt Company (Newfane, N. Y.) was held recently. Better service to the paper manufacturing industry was the main objective of the conference. This is being achieved by a closer tie-in between the sales and manufacturing departments.

Field men, engaged in sales and service to the paper industry, were given a complete tour of the plant. A detailed explanation was made of the latest improvements in equipment and the most recent refinements in operation which have resulted in an even finer Tenax felt than was available a year ago.

◆

COCHRANE CORP. MARKS ITS EIGHTY-FIFTH ANNIVERSARY

Cochrane Corporation, Philadelphia, manufacturer of water conditioning and steam handling equipment, in 1948 celebrates its eighty-fifth continuous year in the power plant equipment field. Cochrane's predecessor, The Harrison Safety Boiler Works, was founded in 1863 to build a cast-iron boiler constructed of sections held together by tie bolts. In 1880 David Cochrane, foundry and shop foreman, developed what is claimed to be the first practical oil separator for cleaning exhaust steam.

Beginning in 1900, the commercial application of heat as an aid in water softening was introduced. This resulted in accelerated chemical reactions of the dissolved mineral hardness with the added reagents, usually lime and soda ash, establishing new standards of performance in water conditioning.

In 1921, experimentation with the Cochrane open heater resulted in modifications that provided deaeration in addition to heating. Over the years various types of heat recovery systems and other related steam specialties were developed. Over forty sales and engineering representatives are maintained throughout the United States. Other representatives are located in Canada, Mexico, Cuba, Puerto Rico, Argentina, and France.

◆

PENNSALT PLANS FLUORINE CHEMICALS PLANT IN KY.

The Pennsylvania Salt Manufacturing Company has announced it will build a new fluorine chemicals plant near Paducah, Kentucky. The new plant will fill Pennsalt's requirements for additional facilities for its expanding production of fluorine chemical products.

The plant site is directly north of Calvert City, between Paducah and the new T. V. A. Kentucky dam at Gilbertville. Construction will be started in the near future and the first unit of the plant is expected to be completed by February, 1949. The new plant ultimately may include other products and is expected to be one of Pennsalt's largest.

The first phase of the plant's operation will be devoted to production of hydrofluoric acid. James McWhirter, formerly superintendent of the Natrona (Pa.) plant, will be superintendent of the new operation.

◆

▶▶▶ FOURTEEN LECTURES by papermaking authorities have been scheduled by Shartle Brothers Machine Company, Middletown, Ohio. The program started January 7 with 100 men in attendance. The lectures were arranged to bring practical information to people in the Black-Clawson, Dilts, and Shartle organizations.

◆

NEW DIVISION ORGANIZED BY HEWITT-ROBINS, INC.

A new division, Robins Engineers, has been organized by Hewitt-Robins, Incorporated, to handle the contracting phases in the design, engineering and installation of complete materials handling and processing plants.

Harold von Thaden, who joined Robins Conveyors twenty-five years ago, heads the new division as vice president. Elmer C. Salzman, a member of the company for thirty-six years, will be vice president in charge of sales, and R. W. Eichenberger, with

Field organization of the Lockport Felt Company. Back row (L to R)—George Hardaker, Edward Johnstone, Alan Dunham, Lester Carner, Thomas Gillespie. Front row (L to R)—Fred Drake, Albert Julin, William Campbell, and Bertram Audley

"If it isn't Wide Enough It isn't Good Enough"

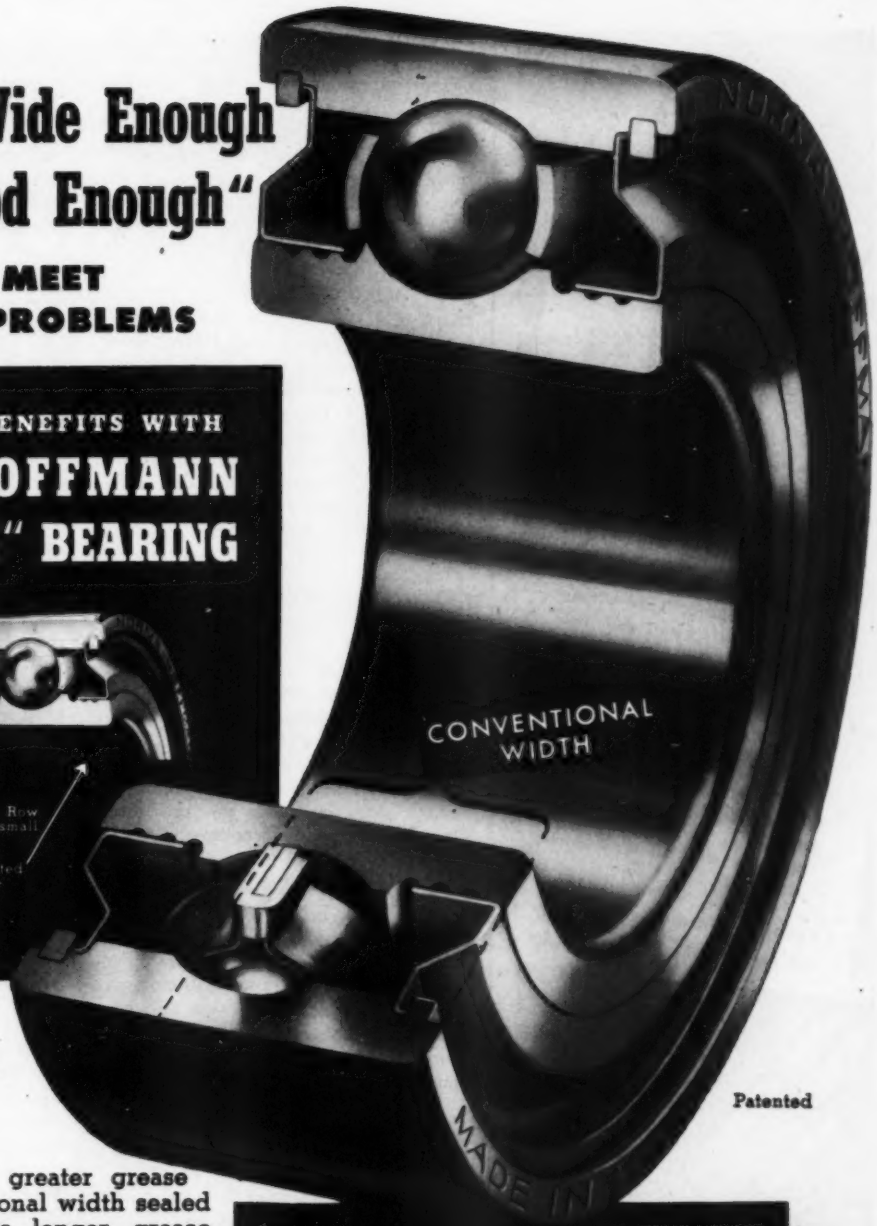
...TO MEET TODAY'S PROBLEMS

GET 3 DESIGN BENEFITS WITH

NORMA-HOFFMANN "CARTRIDGE" BEARING

CONVENTIONAL Single Row Width sealed bearing has small grease capacity.

NORMA-HOFFMANN patented double row width Cartridge Bearing has 100% greater grease capacity.



Patented

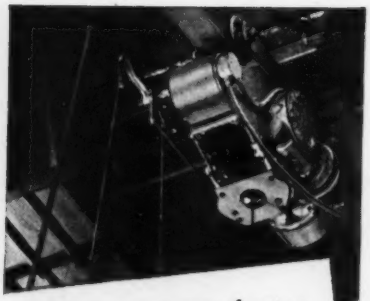
Here's What You Get

1. **Longer Life** A 100% greater grease capacity than conventional width sealed bearings. This means longer grease life... longer periods between relubrication—because a large volume of grease does not oxidize or dry out as readily as a thin film of grease.
2. **Greater Contact Area** 43% to 85% greater contact area between shaft and bearing bore and between housing and bearing O.D., as compared to conventional width bearing. This eliminates need for locknuts and results in greater shaft strength as it is unnecessary to cut locknut threads. Slippage and peening are also prevented.
3. **Full Load Carrying Capacity** Unlike many other sealed bearings, *full size* balls are used; hence, there is no reduction in load carrying capacity.

America's No. 1 SEALED BEARING by NORMA-HOFFMANN

NORMA-HOFFMANN BEARINGS CORPORATION
STAMFORD, CONNECTICUT

FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Seattle, Phoenix



Modern Hoist Logic:
3-2 = LOWER COSTS!

—Yes, rock-bottom handling costs—*and* more output per hour! Here's the record: Heavy drums of chemicals had to be lifted to a raised vat—and lifted fast. The block and tackle formerly used required 3 men to get the proper lift speed. This ½-ton Reading Electric Hoist paid for itself in 2 months by keeping 2 men on their regular jobs and letting the third raise drums alone—in half the previous time! Let a Reading engineer help you get the same kind of handling results with a fast, smooth-working Reading Electric Hoist. Drop us a line today for full details. No obligation, of course.

READING CHAIN & BLOCK CORP.
2113 ADAMS STREET • READING, PA.

READING HOISTS

thirty-eight years of service with the company, will be vice president in charge of the Midwest office in Chicago.

The fifty engineers assigned to the new division formerly were associated with the concern's Robins Conveyors Division. Division headquarters will be at 157 Chambers Street, New York.

◆

▶▶▶ A PROPOSAL TO change the name of The American Rolling Mill Company to Armco Steel Corporation will be submitted to shareholders for consideration at their annual meeting on April 15. The proposed new name has been under consideration for some time since it utilizes the company's trade name "Armco" and also indicates it is a steel company, according to C. R. Hook, president.

◆

▶▶▶ THE PITTSBURGH district sales office of Link-Belt Company, Chicago, is being moved to the former McKay residence at 5020 Centre Avenue, Pittsburgh 13. Although the residence provides temporary quarters which are larger than the former office, plans are being developed for new office and factory-branch store buildings on the site. Otto W. Werner is district sales manager.

◆

▶▶▶ THE ENTIRE LIQUID processing division of Buckeye Laboratories Corporation, of Cleveland, has been purchased by Bowser, Inc., Fort Wayne, Indiana. Production will begin at the Bowser plant as soon as the manufacturing equipment used by Buckeye can be moved and installed.

◆

▶▶▶ A SEVENTY-DAY TRIP recently was completed by Frank W. Smith, vice president of Bulkley, Dunton Paper Company, S.A., in which he gathered first-hand information on the condition of the paper industry in England, Scotland, France, Belgium, Holland, the Scandinavian countries, Finland, and the British and American zones of Germany. Mr. Smith confirmed the general reports about the critical paper shortage in these countries.

◆

▶▶▶ A TEN-YEAR STUDY in its Physical Laboratory and in the field has been conducted by The Timken Roller Bearing Company, Canton, Ohio. The results reveal a 25 per cent increase in the radial and thrust load carrying capacities of the Timken company's complete line of tapered roller bearings. This increase is based on several factors, including alloy steels made specifically for antifriction bearings, better metallurgical control, more accurate manufacturing equipment, greatly improved surface finishes, and more accurate inspection methods.

◆

▶▶▶ LAND AND BUILDINGS of Detroit Steel Corporation's Cleveland branch have been sold to The Reliance Electric & Engineering Company, of Cleveland. Plans are underway for a new Detroit Steel plant in Cleveland, and the existing processing equipment in the old branch, supplemented by new facilities, will be moved there.

◆

▶▶▶ TRADE-MARK RIGHTS to the name "saran" have been released by The Dow Chemical Company (Midland, Mich.) permitting it to become the descriptive name of the product. The term applies to a series of thermoplastic resins chemically known as vinylidene chloride copolymers originally developed by Dow in the latter thirties and known especially for resistance to a wide range of chemicals.

◆

▶▶▶ THE ACQUISITION OF the S. T. Dahl Company, of Los Angeles, along with its personnel, by the American Cyanamid Company has been announced. Sheldon T. Dahl has been appointed West Coast sales manager for the Industrial Chemicals and Plastics Divisions of the American Cyanamid Company.

◆

▶▶▶ PACIFIC DISTRICT headquarters of the Harris-Seybold Company have been moved to 885 Bryant Street, San Francisco 3, California, according to William G. Martin, vice president and Pacific District manager.

◆

▶▶▶ THE ACQUISITION OF E. B. Badger & Sons Company, Boston, by Stone & Webster, Inc., of New York, for its subsidiary, Stone & Webster Engineering Corporation, has been announced. For the present, the Badger company and Stone & Webster will continue to operate as individual entities, but will share technical ability and experience in order to offer broader services to their clients.

◆

▶▶▶ ABOUT 175 PEOPLE attended the annual Sales Conference of the Industrial Truck Division of the Hyster Company, Danville, Illinois, on January 8, 9, and 10. Attending were export and domestic dealers as well as Hyster Company personnel. Following the conference, participants left on a special train for the National Materials Handling Show in Cleveland.

Smoothness in flow control....

POWELL VALVES

Fig. 375— 200-pound Bronze Gate Valve with screwed ends, inside screw rising stem, union bonnet and renewable, wear-resisting "Powellium" nickel bronze disc.

Like the smooth performance of a birch canoe paddled by an expert on the still waters of a lake—that's the way a Powell Valve operates. For into every valve engineered by Powell go the skills accumulated through more than a century of making valves—and valves only.

Perfection of design, scientific selection of materials, finishing to exacting specifications—all contribute to smooth, dependable performance that insures longer life and reduces maintenance to a minimum.

So when you need valves—either for new installations or for replacements—remember there's a "smooth" Powell Valve for every flow control service in modern industry.

Fig. 1816—Large 125-pound All Iron Gate Valve. Made in sizes 2" to 30", inclusive. Has outside screw rising stem, bolted flanged yoke and taper wedge solid disc.

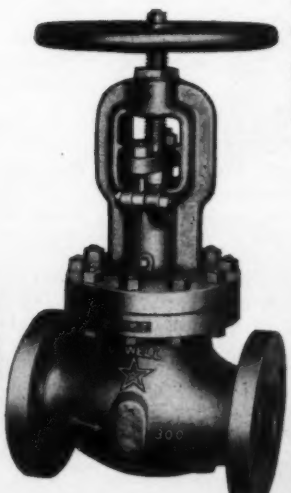


Fig. 3031—Class 300-pound Cast Steel Globe Valve. Has flanged ends, bolted flanged yoke and outside screw rising stem.

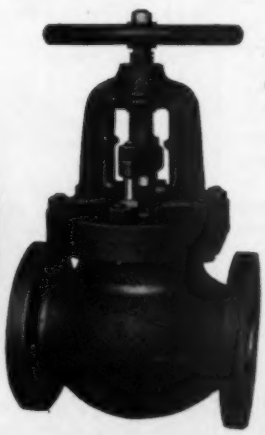


Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", incl. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron.

The Wm. Powell Co.
Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS
IN ALL PRINCIPAL CITIES

POWELL VALVES

THIS IS THEIR

Fourth

LAYNE WELL

CITY OF ROLLA, MO.

The picturesque and progressive city of Rolla, Missouri, has assured itself of much greater residential, business and industrial growth by adding the fourth Layne Well Water Supply unit, to step their daily water capacity up to 2,500,000 gallons. In purchasing these carefully designed and precision built wells and pumps, the city has made an excellent financial investment. Operating at an unusually low cost, their Water System will show a substantial annual profit Furthermore, their Layne Wells and Pumps will probably need only very minor repairs for years and years. Layne Well Water Supply Systems, whether installed for cities, factories, railroads, chemical plants, refineries or irrigation projects, can be depended on to give outstanding satisfaction. For further facts, address LAYNE & BOWLER, INC., General Offices, Memphis 8, Tennessee.

LAYNE WELL WATER Systems

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Wash. * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minn., Minneapolis, Minn. * International Water Supply Ltd., London, Ont., Can. * Layne-Hispano Americana, S. A., Mexico, D. F.

GREEN CROSS FOR SAFETY

SAFETY

▶▶▶ THE SECOND ANNUAL joint safety conference of labor and management representatives of the pulp and paper industry in Washington state was held in Tacoma on January 21 and 22. About 150 persons attended, representing twenty-three pulp and paper mills. Co-chairmen were John Sherman, vice president of the Pulp, Sulphite and Paper Mill Workers Union, and O. B. Hartwig, general safety supervisor of the Crown Zellerbach Corporation.

◆

▶▶▶ AN AWARD will be presented within the next few months to a member mill of the Southern Pulp and Paper Safety Association. The *Southern Pulp and Paper Manufacturer* is the donor of this award which will be christened the Safety Achievement Trophy. This prize will be presented to the Association with the hope that competition between the Southern mills will be stimulated.

◆

SAFETY SCORES

▶▶▶ IN THE PAPER INDUSTRY Safety Contest, which began June 30, 1947, the November average frequency rate of 14.67 for all contestants was 4 per cent below the rate of 15.24 for October. The cumulative frequency rate for five months was 15.54, a decrease of 12 per cent from the rate for the same period of the 1946-47 contest. Reduction in the cumulative rates is based on rates of companies competing in both contests. Thirty-three companies have perfect records to date.

Division I—Pulp and Paper Mills

Group A
(None.)

Group B
Marinette Paper Co., Marinette, Wis.
St. Croix Paper Co., Woodland, Me.

Group C
The Mead Corp. (Sylva Div.), Sylva, N. C.
The Crystal Tissue Co., Middletown, Ohio.
Certain-teed Products Corp., York, Pa.
Container Corp. of America, Wabash, Ind.

Group D
Armstrong Cork Co., Pensacola, Fla.
Hollingsworth & Whitney Co. (Abenaquis Mill), Madison, Me.
Hollingsworth & Vose Co., West Groton, Mass.
Certain-teed Products Corp., Dallas, Texas.
Container Corp. of America, Carthage, Ind.
Container Corp. of America, Circleville, Ohio.
Fort Wayne Corrugated Paper Co., Vincennes, Ind.
Riegel Paper Corp. (Hughesville Plant), Riegelsville, N. J.
Spaulding Fibre Co., Inc., Milton, N. H.
United States Gypsum Co., Oakmont, Pa.
National Gypsum Co., Garwood, N. J.
National Gypsum Co., Newburgh, N. J.
Container Corp. of America, Los Angeles, Calif.
Kimberly-Clark Corp., Kapuskasing, Ont., Can.
Container Corp. of America, Wilmington, Del.
Container Corp. of America (Western Container), Tacoma, Wash.

Division II—Paper & Board Remanufacturing

Group A
(None.)

Group B
Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Can.
Container Corp. of America, Fort Worth, Texas.
Old Colony Envelope Co., Westfield, Mass.
Container Corp. of America, Cleveland, Ohio.

Group C
Ft. Wayne Corrugated Paper Co. (Rochester Div.), Rochester, N. Y.
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
Container Corp. of America, Baltimore, Md.
Container Corp. of America (Container Div.), Los Angeles, Calif.
The Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Calif.
The Hankins Container Co., Chicago, Ill.
Essex Paper Box Mfg. Co., Newark, N. J.
Bay West Paper Co., Green Bay, Wis.

TENAX FELTS ARE LONG LASTING

SERVING THE PAPER INDUSTRY SINCE 1891

If you have not as yet put Tenax Felts to the test—or our service to the proof—we invite you to afford us that ooportunity.

LOCKPORT FELT COMPANY • NEWFANE, NEW YORK

ENRIGHT A. ELLIS ELECTED PRESIDENT OF DOWNINGTOWN

Following a recent meeting of the directors of the Downingtown Manufacturing Company, Downingtown, Pa., Chairman of the Board Ellis Y. Brown, Jr., announced that Enright A. Ellis had been elected president and he continues with the position of treasurer, which he formerly held.

Enright, son of "Charlie" Ellis, a former president of the company, came with the firm on June 8, 1934. He had graduated from the University of Maine, with a chemical engineering degree from their pulp and paper division, after which he went with the Veldown Company of Glen Falls, New York, where he worked in all operating departments. He became assistant general manager and director of the Downingtown Manufacturing Company on January 16, 1941, and in March, 1944, became vice president in charge of manufacturing. In August, 1946, he was elected vice president and treasurer.

During his first few years with the company, Enright Ellis served in the sales department. He is a member of TAPPI, the Newcomen Society, and the University of Maine Alumni Association, and has a host of friends in the paper industry.

At the same meeting, Oscar C. Cordes was elected a director of the company and vice president in charge of sales; Harry C. Merritt, vice president in charge of engineering; and Andrew E. Walker, vice president in charge of manufacturing. Ellis Y. Brown, 3rd, continues as secretary, and Ellis Y. Brown, Jr., who retired as company president, in 1946, remains chairman of the board.

At the same meeting, Harry L. Lowe was named controller and G. Clifton (Clif) Walton, director of public and industrial relations. Clif is a member of TAPPI and the Engineers Club of Philadelphia.

Oscar C. Cordes has been with the sales department of the company for fourteen years and recently has been assistant sales manager. Prior to his association with Downingtown, he spent some fourteen years in the general engineering department of Westinghouse Corporation, working on paper mill applications. During this period he patented a number of devices applying electrical controls to papermaking equipment. He graduated from Cooper Union with a degree of B. S. in electrical engineering, and is a member of TAPPI.

Harry C. Merritt joined the company in 1940 as assistant chief engineer. He is well known in the industry and was formerly plant engineer for Hollingsworth & Vose (East Walpole, Mass.) for many years. He is a graduate of Worcester Polytechnic Institute, with a B.S. in mechanical engineering, is a member of the American Welding Society, and also a member of TAPPI.

Andrew E. Walker came to the Downingtown Manufacturing Company in 1902 to learn the machinist's trade. He grew up with the company and was shop superintendent commencing January 1, 1940, and during the trying days of the last World War when the company was building for the Army, Navy, and various war industries.

◆

H. L. HAMILTON ADDED TO QUARTERMASTER INSTITUTE

Major Harold L. Hamilton has been assigned to the Quartermaster Food and Container Institute for the Armed Forces, Chicago. He will serve in the Rations Planning Office as economic analyst, providing advice regarding resources for materials, military requirements, trends in production, and the availability of materials required in the feeding programs of the Armed Forces.

A graduate of Lawrence College, Appleton, Wisconsin, Major Hamilton was employed for fifteen years as a paper production expert by the Appleton Coated Paper Company.

In the postwar period he was officer in charge of pulp and paper production in the Economics Division of the Office of Military Government for Germany. In this capacity he controlled the allocation of materials going into pulp and paper and negotiated with foreign nations for the purchase of needed raw materials. He also was industrial consultant to the Trade and Commerce Group and United States member of the Industrial Subcommittee on Pulp and Paper of the Allied Control Authority. In addition, Major Hamilton was industrial adviser to German economic offices on pulp and paper matters.

Left to right—Enright A. Ellis, Oscar C. Cordes, Harry C. Merritt, Andrew E. Walker, and G. Clifton Walton, all of Downingtown Manufacturing Co.

P.P.&E.
CREASED BENDS
and
Corrugated Tangents

SAVE SPACE

REDUCE STRESS

IMPROVE OPERATION

A P. P. & E. Corrugated Tangent has much more flexibility than a straight pipe of equal length, diameter, and wall thickness. A creased bend maintains full wall thickness on the outside of the bend.

This inherent flexibility minimizes movement caused by thermal expansion. It makes practicable the use of shorter radius bends, with full wall thickness, without causing excessive end reaction against equipment. It also makes possible higher head clearances, more easily accessible valves, and more convenient location of auxiliary equipment.

Creased Bends and Corrugated Tangents can be prefabricated by us in any practical design. This is an important feature, since the characteristics of this type of piping often permit installation of a more complex system in an existing structure, thus avoiding need for constructing or enlarging a building. Consult our nearest representative.

Pittsburgh Piping

AND EQUIPMENT COMPANY

10 Forty-Third Street—Pittsburgh, Penna.

Woolworth Building, New York — Peoples Gas Building, Chicago
Chamber of Commerce Bldg., Indianapolis — Public Square Building, Cleveland
Book Tower, Detroit — 70 High Street, Boston
925 Market Street, San Francisco — Heights State Bank Bldg., Houston
Whitehead Building, Atlanta

BJARNE KLAUSSEN ELECTED VICE PRESIDENT OF HOOKER

Bjarne Klaussen has been promoted to vice president in charge of production of the Hooker Electrochemical Company, Niagara Falls, New York.

Mr. Klaussen, a graduate of the University of Oslo, has been a member of the Hooker organization since 1916. He has been works manager of the Niagara plant since 1940 and a member of the company's board of directors since 1942.

◆

McCABE IS APPOINTED BOARD CHAIRMAN OF THE FEDERAL RESERVE SYSTEM

From the White House on January 27 came the announcement that President Truman had appointed Thomas B. McCabe, president of the Scott Paper Company, to the office chairman of the Board of Governors of the Federal Reserve System. Mr. McCabe is chairman of the Federal Reserve Bank of Philadelphia.

The term of Marriner S. Eccles, former Board Chairman of the Federal Reserve, expired February 1. His term as a reserve governor extends to 1958. Last reports indicated he had decided to remain a member of the Board.

During the war years, Mr. McCabe held a series of important government jobs. He has been president of Scott Paper Company since 1927.

◆

DR. DAVIS NAMED ASSOCIATE TECH. DIRECTOR OF K-C

Dr. M. N. Davis, superintendent of the Physics Research Laboratory for the Kimberly-Clark Corporation since 1937, has been named associate technical director. In his new position, Dr. Davis will assist in the operation of the technical department with particular emphasis on the scientific phases of the work while continuing in his present capacity as head of physics research.

Dr. Davis has been associated with Kimberly-Clark since 1929, when he became the first full-time physicist employed in the paper industry. After he took his A.B. degree at Milton College in 1924, he completed the work for the Ph.D. in Physics at the University of Wisconsin in 1929. He functioned as a group leader in applied physics at Kimberly-Clark until a separate Physics Research Laboratory was set up in 1937 and he was chosen to direct its activities.

His work has included the application to paper manufacture of the fields of electronics, photometry, acoustics, applied mechanics, hydrodynamics, heat transfer, and rheology. He is known as the inventor of the Bausch and Lomb Opacimeter, and the Thwing Paper Formation Tester; he was also closely associated with the development of the G. E. Reflectance Meter. Personnel of the Physics Research Laboratory includes, besides Dr. Davis, six college-trained scientists, three of whom hold Doctors and two Masters degrees.

Kimberly-Clark Corporation pioneered in the application of scientific knowledge to papermaking 35 years ago, when a program was inaugurated to set up process controls. Directly after World War I, a research program was instituted by H. A. Rothchild, present technical director, which has gradually expanded until today it has its own technical and research center at corporation headquarters, manned by approximately 160 professional men and technicians.

Dr. Davis is a member of the American Physical Society, the Optical Society of America, the American Institute of Physics, and TAPPI.

◆

Bjarne Klaussen

Thomas B. McCabe

Dr. M. N. Davis

▶▶▶ A new member of the staff of the Quartermaster Food and Container Institute for the Armed Forces, Chicago, is Captain *Angelo A. Laudani.* He will serve with the Rations Planning Office where he will assist in the development of rations for military feeding.

◆

▶▶▶ Appointments announced by the Plastic Materials Sales Division of The B. F. Goodrich Company, Akron, Ohio, include: *N. P. Singleton* as manager of sales for cast and calendered film, coated paper and packaging materials; *E. L. Byan* as manager of sales for coated fabric and calendered sheet, coated wire products and Playponds; *William M. Gaston* as manager of distributors' sales; and *R. L. Hill* as manager of sales for extruded and molded products.

◆

▶▶▶ *Nathaniel F. Davis,* manager of the Davis Boxboard and Fibreboard Division of the Hoague-Sprague Corporation (Lynn, Mass.), retired as of January 1 of this year. Mr. Davis was manager of the Davis Paper Company for over forty years, the last ten years as manager of that mill for Hoague-Sprague.

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▶▶▶ *Lawrence H. Jones* has been appointed sales representative in the Chicago territory for Calco Chemical Division, American Cyanamid Company. Mr. Jones was associated with the International Smelting & Refining Company from 1934 until 1941 when he was called to active duty in the Army Chemical Warfare Service.

A. B. RECKNAGEL TO HEAD NEW FORESTRY DEPARTMENT AT ST. REGIS PAPER CO.

St. Regis Paper Company, which is consolidating its forestry activities, has appointed A. B. Recknagel as technical director.

A. B. Recknagel

Mr. Recknagel is a forester of long experience. A graduate of Yale Forestry School, he spent a year studying forest operations in Europe. He served in the United States Forest Service in several capacities and later entered the consulting forestry field. Prior to the war, he was head of the Forestry Department of Cornell University. His most recent association was as acting head of the Forestry Department of the University of British Columbia. It is planned that at the close of the college year, a Forestry Department will be set up by St. Regis with headquarters in New York, and a technical staff to work under Mr. Recknagel will be developed.

Mr. Recknagel is a long-time member of the Society of the American Foresters and served on its National Council. He is author of textbooks dealing with forest management and has written articles for the *Journal of Forestry*.

◆

▶▶▶ The appointment of *John H. Heuer* as assistant to Fred C. Goodwill, technical director of the Printing, Publication and Converting Paper Division (Deferiet, N. Y.), has been announced by the St. Regis Paper Company. His previous positions included research chemist for Weyerhaeuser Timber Company, assistant sulphite superintendent for Oxford Paper Company, research chemist for Berst-Forester-Dixfield, and technical director for Newton Falls Paper Company.

▶▶▶ The president of the Simplex Wire and Cable Company (Cambridge, Mass.), *Everett Morss*, has been elected to the board of directors of Arthur D. Little, Inc., of Cambridge. Mr. Morss' election represents the second generation of his family's association with Arthur D. Little, Inc., since his father was a classmate of Dr. Arthur D. Little at Massachusetts Institute of Technology and later a director of the research organization. Mr. Morss replaces as director, Governor W. Cameron Forbes, who resigned after twenty-five years on the board.

◆

▶▶▶ The addition of *Fred E. Bahrenburg* to its development and sales staff has been announced by the Hammermill Paper Company (Erie, Pa.). Mr. Bahrenburg is a graduate of the College of Forestry, Syracuse University. He formerly was assistant to the president at the Strathmore Paper Company.

◆

▶▶▶ The 1948 Industrial Research Institute medal presented for outstanding contribution to the field of industrial research will be received by *Games Slayter*. As vice president in charge of research and development of Owens-Corning Fiberglas Corporation, Mr. Slayter has played a major role in the development of Fiberglas from its crude beginnings in the early 1930's to its present place as a basic material.

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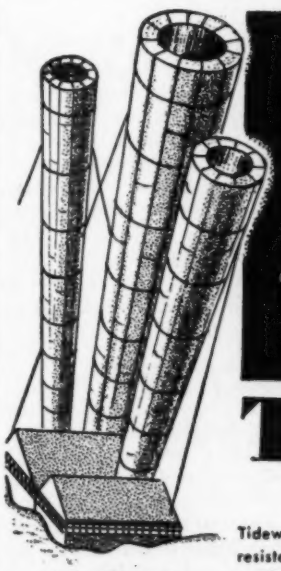
▶▶▶ *F. E. Schueppert* of Neenah, Wisconsin, has been appointed manager of the Rhinelander Paper Company of Rhinelander, Wisconsin. He formerly was with the Kimberly-Clark Corporation.

◆

▶▶▶ The promotions of *Harry Green* as consultant on machine shop operations and *Carl Senn* as consultant on methods engineering have been announced by The Falk Corporation, Milwaukee. *B. C. Bugbee*, former production control manager, has been named machine shop superintendent, and *Robert Fischer* is now in charge of all standards throughout the plant.

◆

▶▶▶ Former manager of the Cheboygan mill of the Paper Corporation of America, *R. J. Knowles*, is now associated with Kurt Wandel Industries, Incorporated, with headquarters in Honey Brook, Pennsylvania. Mr. Knowles' wide experience and acquaintance in the paper industry will be used to further the introduction of the DynoPulper and the new Dyno-Finer.



A WOOD
Naturally Resistant
TO ACIDS, ALKALIES AND DECAY

Tidewater
RED CYPRESS

Tidewater Red Cypress serves better and lasts longer. It's natural resistance to acids, alkalies, etc. insures long and satisfactory results when used in vent stacks, pickling troughs, electroplating vats, etc. It's use under these conditions truly confirms its claim to being "The Wood Eternal".

If you have a particularly perplexing problem let us help you solve it. We invite inquiries concerning all types of tanks and vats . . . fully fabricated or partially fabricated.

Tidewater Red Cypress "The Wood Eternal"

FLEISHEL LUMBER COMPANY

4234 Duncan Ave., St. Louis 19, Mo., NEwstead 2100

S. J. O'CONNOR NAMED AS MANAGER OF WASHINGTON OFFICE OPENED BY MANDO

Stanley J. O'Connor has been named to serve as manager of the Washington office being reopened by Minnesota and Ontario Paper Company, Minneapolis. He will act as liaison in all matters between company and government officials, keeping abreast of current governmental policies and regulations which affect the pulp, paper and insulating board industry.

S. J. O'Connor

During the war, Mr. O'Connor was located in Washington and handled priorities for Mando in its filling of government contracts. He joined the company in 1933 and recently has been manager of its by-products sales.

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ORGANIZATIONAL CHANGES AND PROMOTIONS AT DE LAVAL

Changes affecting sales, production, and engineering divisions of the De Laval Steam Turbine Company, Trenton, New Jersey, have been announced. Under the reorganization, a five-member executive committee has been created consisting of H. L. Watson, president, serving as chairman; George C. Stoddard, chairman of the board; Henry W. Johnson, vice president; C. Richard Waller, vice president; and George W. Smith, Jr., assistant to the president.

J. P. Stewart has been appointed manager of the newly combined commercial and marine sales divisions succeeding H. V. Petersen, who has retired after thirty-four years of service. H. G. Bauer, manager of the marine division, has been appointed executive engineer of the company. J. W. Hertzler, manager of worm gear sales since 1924, has retired and is succeeded by W. A. Reynolds, who becomes manager of the combined IMO rotary pump and worm gear division. C. A. Jurgensen has been appointed acting works manager.

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▶▶▶ The retirement from active duty of *John B. Newman*, vice president and Washington representative of the Corn Industries Research Foundation, of New York, has been announced. He will, however, be retained in an advisory capacity. Succeeding him in the Washington office are *Floyd J. Hosking*, director, and *Howard A. Prentice*, associate director.

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▶▶▶ Branch manager *Francis G. LaFave*, of the Taggart Corporation multiwall plant of the St. Regis Paper Company, Watertown, New York, has been transferred to the St. Regis Company's new bag plant at Pensacola, Florida.

◆

▶▶▶ The honorary degree of Doctor of Engineering was awarded *Dr. David H. Dawson*, director of sales of the Pigments Department of the Du Pont Company, by the Drexel Institute of Technology at the institution's Founder's Day convocation in December. He is a graduate of Drexel and received his doctorate from Ohio State University.

◆

▶▶▶ Election of *W. A. Roberts* and *W. C. Johnson* to the board of directors of Allis-Chalmers Manufacturing Company, Milwaukee, has been announced. Mr. Roberts is executive vice president in charge of the company's tractor division, while Mr. Johnson is executive vice president for the general machinery division. The new directors succeed the late *Dr. Charles E. Albright* and *Harold S. Falk*, president of the Falk Corporation.

◆

▶▶▶ After a year's absence, *Armand R. Bollaert* has rejoined the Dicalite Division of Great Lakes Carbon Corporation and The Dicalite Corporation as general manager. Prior to leaving the company, he was technical director of the Dicalite Division. Mr. Bollaert will make his headquarters in Los Angeles.

◆

▶▶▶ *Morris Gintzler* has been named chairman of the board of the Pulp and Paper Trading Company, and *O. Frederick Swanson*, general manager, has been advanced to the presidency as the successor to Mr. Gintzler. *Erwin Brown* and *Joseph L. Fox* have been elected vice presidents and *Jordan S. Tucker*, secretary.

▶▶▶ Announced is the appointment of *Alfred J. Olson* as an assistant sales manager of Joseph T. Ryerson & Son, Inc. He succeeds *Ray C. Page*, who was recently named sales manager of the company's new steel service plant under construction in the San Francisco area. Mr. Olson became a member of the Ryerson organization in 1923.

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▶▶▶ Promotion to the Sales Development Department of the Hooker Electrochemical Company (Niagara Falls, N. Y.) has been given to *John P. Edwards*. He will handle technical correspondence with respect to the use and application of Hooker chemicals. Joining Hooker in 1940, Mr. Edwards has been associated with the Process Study Group.

◆

PATTERSON CO. APPOINTS COOPER AS CHIEF ENGR.

As chief engineer of The Patterson Foundry & Machine Company, East Liverpool, Ohio, *Ralph F. Cooper* will be in charge of all the company's mechanical engineering, both in the plant and in the field.

R. F. Cooper

The company's engineering activities have been considerably broadened in scope and a corresponding increase of engineering department personnel is being made to accommodate the greater volume of business resulting from wider sales coverage and expansion of equipment design for the chemical and processing industries.

◆

▶▶▶ Formerly an engineer with National Paper Products Company (Carthage, N. Y.), *Edwin Ware*, has been appointed manager of the San-Nap-Pak Mills at Rockland, Delaware.

Sandy Hill QUICK-OPENING GATE VALVE

Designed especially
for handling
PULP & PAPER STOCK
AND WATER
under
LOW PRESSURE

5 Important Advantages

1) QUICK-ACTING. Can be opened in a fraction of the time required with a screw valve.

2) Slide can be held in any required position by the clamp.

3) Slide can easily be removed from valve without taking valve from the pipe—simply loosen bolts holding bonnet to body.

4) If valve becomes clogged, preventing proper closing of slide, valve can readily be cleaned by loosening bolt on bottom plate and turning it to one side.

5) Stem end is cut standard pipe thread, permitting extension by connecting a piece of pipe. No threads on working part of stem to wear out. No nuts or hand wheels to be broken or lost. Gate cannot get loose from stem.

Write for folder

Available In

ALL CAST IRON

CAST IRON WITH BRONZE SLIDES

ALL BRONZE

Flanges may be had plain, as normally supplied, drilled or drilled for spiral bevel pipe.

QUICK-OPENING . . . for those places where a valve MUST open quickly . . .

. . . on all-stock pipes leading to screens . . . on wet machines . . . where rewater is used over again to thin the pulp coming from grinders . . . in connection with beaters, when slush pulp is used . . . on all pipe lines furnishing slush pulp . . . is any place where low pressure valves can be used.

THE SANDY HILL IRON & BRASS WORKS
HUDSON FALLS, N. Y.

JUAN P. BOSCH RETURNS TO BULKLEY, DUNTON CO.

Juan P. Bosch has rejoined Bulkley, Dunton Paper Company, S. A., in New York as manager of sales in several Latin American countries.

Juan P. Bosch

Mr. Bosch had left Bulkley, Dunton for a brief spell to take charge of the Buenos Aires office of Van Reekum Paper, Inc. Previous to that he had been with Bulkley, Dunton for six years. He is a veteran of the paper business with a varied export experience of twenty-two years.

◆

WARD HARRISON RETURNS TO RIEGEL—PROMOTION GIVEN TO F. S. LEINBACH

As of January 19, Ward Harrison returned to Riegel Paper Corporation as assistant to Walker Hamilton, executive vice president and general manager.

Mr. Harrison has been with Ecusta Paper Corporation, Pisgah Forest, North Carolina, since 1941. Prior to that time he was with Riegel for five years; first as a laboratory technician; later he became a plant chemist. He joined Ecusta as a process engineer and became assistant general manager in 1944.

Another appointment announced by the Riegel company is that of F. S. Leinbach, who is now assistant to A. P. Mitchell, company vice president and general sales manager. Mr. Leinbach has been with Riegel since 1934. From the position of plant chemist in the coating department he was made a sales engineer in 1942. During the war, he was loaned to the Government and served as assistant director of the Containers Division of the WPB for a year and a half. Following his return from Washington, he served as an assistant to the general manager.

In these announcements, mention is made of Riegel's southern operations which comprise 140,000 acres of timberland near Acme, North Carolina, and it is stated that the company is favorably inclined to this location as a suitable location for a pulp mill.

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▶▶▶ Executive engineer *George M. Pennock,* has been elected a vice president of The Moore & White Company, Philadelphia. The board of directors also elected plant manager *Henry Lebmuth, III,* a vice president. *George Lear* was re-elected as president and *Conrad J. Kern* as board chairman.

◆

A. O. SMITH CORP. NAMES L. B. SMITH GENERAL MGR. OF ITS KANKAKEE WORKS

L. B. Smith, vice president and director of the A. O. Smith Corporation, Milwaukee, has been appointed general manager of the Kankakee Works of that company.

Mr. Smith will relieve H. F. Detrick who has been holding that post in addition to his increasing responsibilities as president of the Smith Meter Company of Los Angeles, wholly owned subsidiary of the A. O. Smith Corporation.

L. B. Smith

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▶▶▶ Former chief engineer of the pulp division power plant of the Weyerhaeuser Timber Company at Everett, Washington, *Tom Stewart,* has been named superintendent of power of the company's new power plant at Longview.

CHAIN BELT CO. ELECTS THREE VICE PRESIDENTS

Three vice presidents have been elected by the directors of the Chain Belt Company, Milwaukee.

L. B. McKnight, who joined the company in 1927, has been elected vice president with executive responsibility for the two heavy machinery divisions, Conveyor and Process Equipment Division and the Construction Machinery Division.

L. B. McKnight

O. W. Carpenter has been elected a vice president in charge of finance. Formerly was secretary-treasurer and a director of the Kearney and Trecker Company, he came to Chain Belt in 1943. B. F. Devine, also elected vice president, joined Chain Belt in 1909. He has served as sales manager of the Construction Machinery Division and will continue his present duties as manager of that division.

◆

E. S. NOBLE TO DIRECT CANADIAN ACTIVITIES OF KIMBERLY-CLARK CORP.

Edgerton S. Noble, for many years managing director of Spruce Falls Power & Paper Company, Ltd., will hereafter devote his entire time to various Canadian activities of Kimberly-Clark Corporation. Mr. Noble's headquarters will be in Toronto.

Guy McRae has been named to succeed Mr. Noble as manager of the Spruce Falls mill and town operations with headquarters at Kapuskasing, Ontario.

Mr. Noble is vice president of Kimberly-Clark Corporation of Canada, Ltd., but will not confine his activities to that company alone. He will work closely with the executive management of the company in the

United States. A major purpose of the change is to provide over-all staff co-ordination in connection with the steady growth of Kimberly-Clark activities in Canada.

◆

WM. CRONKHITE RETIRES FROM GENERAL ELECTRIC

William W. Cronkhite, one of the founders and former manager of General Electric's Industrial Manufacturers Division, retired recently after more than thirty-eight years of service with the company.

Mr. Cronkhite, who joined G. E. in December, 1909, was responsible for the original organization and training of a staff of specialist industry salesmen. He was manager of this division until August 1, 1947, when he became advisory consultant and K. R. Ross succeeded to the position.

◆

LOCKPORT FELT ELECTION BRINGS OFFICIAL CHANGES

Directors of the Lockport Felt Company, Newfane, New York, elected former Senator William H. Lee as president and chairman of the board, and his son, Raymond J. Lee, as executive vice president and treasurer. Both officers were elected directors at the annual meeting of the stockholders.

Raymond J. Lee has had the direction of mill activities since his return from service in the Navy. Now elected to the newly created office of executive vice president, his authority has been broadened and he will have complete charge.

Mrs. Elizabeth Lee, who has served as vice president, and Bertram A. Audley, who has been assistant to the president, have now been elected first vice president, and second vice president in charge of sales and assistant treasurer, respectively.

◆

GREENWALT NOW DU PONT PRESIDENT — CARPENTER IS MADE CHAIRMAN OF BOARD

The election of Walter S. Carpenter, Jr., as chairman of the board of E. I. du Pont de Nemours & Company followed his resignation as president of the company. Mr. Carpenter had directed the affairs of the company for nearly eight years, including the entire period of World War II.

Successor to Mr. Carpenter as company president, is Crawford E. Greenwalt, who became the tenth man to hold that office in the 146-year history of the organization. Mr. Greenwalt's service record totals more than a quarter of a century in various capacities. He became a chemist in the Philadelphia works of du Pont in 1922 following his graduation from MIT. Subsequently, he served in four industrial and two auxiliary departments, and as a vice president and director. During World War II he had an important role in the company's part in the atomic energy program.

◆

RAYONIER INC. APPOINTS R. ERICKSON MANAGER OF FERNANDINA, FLA., MILL

Russell F. Erickson has been appointed resident manager of the Fernandina, Florida, mill of Rayonier Incorporated. He became associated with the company early in 1946 as plant engineer, and in 1947 was appointed assistant resident manager. He succeeds James T. Sheehy who has been transferred to the Northwest to act in a liaison capacity between various divisions in the Northwest and the executive offices in New York.

Mr. Erickson joined the Minnesota and Ontario Paper Company in 1932, later becoming design and maintenance manager. Early in 1937 he became associated with George F. Hardy & Son. In 1939, he joined Hollingsworth and Whitney, of Boston, and later became plant engineer of its Mobile, Alabama, mill.

C. STEWART LEE RETIRES AFTER FORTY YEARS WITH PUSEY AND JONES CORP.

The retirement of C. Stewart Lee, vice president of the Pusey and Jones Corporation since 1924, was announced following a recent meeting of the board of directors. Mr. Lee will remain a member of the board.

In forty years of association with Pusey and Jones, Mr. Lee visited almost every important paper mill in United States and Canada, and traveled extensively in South America, England, western Europe and Russia.

Mr. Lee was general manager of Pusey and Jones during the first World War. He began in the sales department in 1907.

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▶▶▶ The Reliance Electric & Engineering Company has announced the appointment of *William C. Madsen* as branch manager of its Gary, Indiana office.

◆

DR. JACKSON NOW HEAD OF HAMMERMILL LABORATORIES

Dr. Donald T. Jackson has been appointed director of the Hammermill Paper Company Laboratories at Erie, Pennsylvania. He succeeds the late

THROUGH THESE DOORS PASS
THE MOST DIFFICULT LINING AND TANK PROBLEMS

They enter because gathered under this roof is a vast reservoir of practical and theoretical experience amassed over 63 years specialization in designing, constructing, and servicing linings and tile tanks used in the various pulp and paper making processes.

Since its beginning Stebbins has been closely allied with all new developments. Just now Stebbins engineers are actively engaged on linings for use in the ammonia and magnesia base cooking process.

When you have a lining or tile tank job consult Stebbins.

Stebbins Engineering and Manufacturing Company
EASTERN BOULEVARD, WATERTOWN, NEW YORK

Dr. Bjarne Johnsen (See Necrology).

The new director of the Hammermill Laboratories joined the Hammermill organization in 1933 as a research chemist. He has been assistant director of the Laboratories since 1945.

Dr. Jackson is a graduate of Montana State College and has a Ph.D. degree from the University of Pittsburgh. Prior to joining the Hammermill organization, he taught chemistry at the University of Pittsburgh.

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▶▶▶ A release from the St. Regis Paper Company announces the appointment of *Arch Carswell* to the newly established position of general sales manager of the company's Multiwall Bag Division. Mr. Carswell, who joined the company in 1948, will make his headquarters at the New York office. *H. W. Sloan*, previously assistant Pacific coast manager, succeeds Mr. Carswell as Pacific coast manager of the division.

◆

▶▶▶ President and general manager of Harris-Seybold Company, Cleveland, *G. S. Dively*, has been named a member of the Economic Controls Committee of the National Association of Manufacturers. Recently Mr. Dively was elected president of the Cleveland Branch, National Metal Trades Association.

◆

▶▶▶ The appointment of *John McEwen* to the research staff of the Weyerhaeuser pulp division (Longview, Wash.) has been announced. Mr. McEwen recently received his doctorate from the Institute of Paper Chemistry at Appleton. Another addition is *C. R. McCully*, member of the laboratory staff before the war, who recently obtained his doctorate from the University of Oregon.

◆

▶▶▶ Two appointments have been announced by the Pennsylvania Salt Manufacturing Company. *Thomas W. Cox*, assistant treasurer, also will assume the duties of assistant secretary, succeeding *U. Grant Beath* who retired after forty-seven years of service. *Vance N. Wilson*, former supervisor in charge of tank cars in the Traffic Department, has been named safety co-ordinator for the company.

◆

▶▶▶ Newly appointed district manager of the Bowser, Inc., sales and service office in Albany, New York, is *Bruce W. Grosvenor*. Mr. Grosvenor joined Bowser in 1933 as general manager of the Water Purification Sales Division, and prior to his present appointment was sales manager of the General Line Division. He succeeds *I. D. Bone* who resigned due to ill health after twenty-seven years with the company.

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▶▶▶ Former industrial sales manager, *W. F. Newbery*, has been appointed assistant director of sales for Detrex Corporation, Detroit. Directly reporting to Mr. Newbery will be *LeRoy Camel*, new sales manager of the Industrial Products Division; *H. S. Tweedy*, industrial service manager; *H. J. Lucey*, oil-extraction and export sales manager; and *G. W. Walter*, advertising and sales promotion manager.

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▶▶▶ The president of the Canadian Pulp and Paper Association, Montreal, *R. M. Fowler*, has been re-elected president of the Canadian Institute of International Affairs.

◆

▶▶▶ With a background of long experience in the folding box field, *James H. Blunden* has been appointed sales manager of the Lowman Folding Box Division of United Board and Carton Corporation. He has been with United in its Syracuse, New York plant since 1927.

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▶▶▶ A first-hand study of sales opportunities for products of Clark Equipment Company (Battle Creek, Mich.) in over fifteen countries from Scandinavia to North Africa is being made by *W. P. Baranowski*, sales manager of the Export Division. He is interested particularly in methods employed for handling materials, in intra-plant movement, packaging and loading; and in stevedoring operations.

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▶▶▶ At the annual meeting of The Reliance Electric & Engineering Company, Cleveland, *George F. Karch* was elected a director. Mr. Karch is vice president of The Cleveland Trust Company.

◆

▶▶▶ The new president and general manager of the Paper Corporation of America, Cheboygan, Michigan is *Robert W. Leroy*, who succeeds *I. Lawrence LeSavoy*, recently retired. Mr. Leroy was promoted from vice president.

◆

▶▶▶ The appointment of *John A. Fellows* as assistant chief metallurgist at the company's Research Center in Mahwah, New Jersey, has been announced by American Brake Shoe Company. Dr. Fellows is resuming his association with the company after service in the Atomic Energy Field and with Union Carbon & Carbide Company.

▶▶▶ *James M. White*, vice president in charge of manufacturing at Allis-Chalmers Mfg. Company, Milwaukee, has resigned, but will remain in an advisory capacity to President Walter Geist for the next six months. Mr. White joined Allis-Chalmers in 1929 and successively held the positions of manager of the La Porte (Ind.) works, assistant general works manager in Milwaukee, works manager, and vice president.

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▶▶▶ Formerly located at Rising Paper Company, Holyoke, Massachusetts as assistant superintendent *Frank Kelly* has accepted the position of superintendent at the Stevens Paper Company of Westfield, Massachusetts.

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▶▶▶ *J. Robert Pauline* has been appointed works manager for the Kellogg Division (Rochester, N. Y.) of the American Brake Shoe Company. Formerly assistant to the vice president in charge of operations and engineering, Mr. Pauline first joined American Brake Shoe as an engineer in 1943.

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▶▶▶ The director of public relations for the Brown Instrument division of Minneapolis-Honeywell Regulator Company, *Hank Cabot*, has been appointed chairman of the press relations committee for the 1948 National Conference and Exhibit of the Instrument Society of America, to be held at Convention Hall, Philadelphia, September 13 to 17.

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▶▶▶ New director of purchases of the Scott Paper Company is *L. Carl Stevens*, who will act in a staff capacity to all plants of the company. *Victor G. Sandham* has been appointed purchasing agent for the Chester, Pennsylvania plant of the company.

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▶▶▶ The newly created position of assistant director of research of the Plastics Division of Monsanto Chemical Company has been taken over by *Erwin G. Somogyi*, who has been with Monsanto since 1935.

◆

▶▶▶ In charge of marketing the products of Tube Turns, Inc., in the Houston, Texas area is *W. B. Whenthoff*, who became associated with Tube Turns, Inc. in 1937, when he opened the firm's Tulsa office. The company's Houston office was established by him in 1941.

◆

▶▶▶ Appointment of *M. Joseph Foley* as an executive vice president has been announced by Powell River Company, Limited (Powell River, B. C.). Mr. Foley recently left the

position of vice president of Brooks-Scanlon Corporation, where he had been engaged in exhaustive surveys into the manufacture of pulp and paper from southern pine.

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▶▶▶ Chairman of the board of the Brown Instrument Company, Philadelphia, *Richard P. Brown*, has been made a fellow of the American Society of Mechanical Engineers.

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▶▶▶ Board chairman of Harris-Seybold Company, *R. Verne Mitchell*, has been elected a director at large of the National Association of Manufacturers. He recently was named a director of the Lithographic Technical Foundation and was re-elected president of the National Printing Equipment Association.

◆

WISCONSIN WIRE WORKS APPOINTS HARRY KINNE EASTERN SALES AGENT

Harry C. Kinne, former vice president and sales manager of the Bagley & Sewall Company (Watertown, N. Y.), has taken a position as sales agent of the Wisconsin Wire Works of Appleton, Wisconsin.

Mr. Kinne, who was connected with the Bagley & Sewall Company for forty-one years, will have the eastern section of the United States as his territory with the Wisconsin firm. His duties will require him to travel extensively through the eastern states.

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▶▶▶ E. C. Atkins and Company, Indianapolis, Indiana, has just announced the appointment of *Robert M. Gaunt*, of Houston, Texas to represent the company in the territory of southern Texas, New Orleans and Louisiana, with headquarters in Houston.

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▶▶▶ Mason-Neilan Regulator Company has appointed *E. Putnam Head* as manager of the Atlanta office. Mr. Head joined the company's factory staff in Boston in 1936 and was appointed to the New York sales engineering staff in 1937. In 1939 he returned to Boston as production supervisor and later was appointed manager of the Buffalo office.

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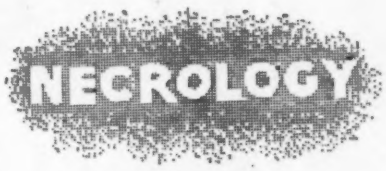
▶▶▶ Division manager of the Mead Corporation, Lynchburg, Virginia, *Leonard R. Growdon*, has been appointed operating supervisor for the board mills of the corporation. He will be succeeded as division manager at Lynchburg by *Paul Ellis*, manager of the Mead plant at Sylva, North Carolina.

▶▶▶ Promotion of *John L. Beard* to manager of the Small Products Division of American Hoist and Derrick Company has been announced. Mr. Beard will direct the sales and merchandising of "Crosby Clips", drop forged fasteners for wire rope, in his division.



RUSSELL B. WILLIAMS

For a number of years connected with the advertising agency of Reincke, Meyer & Finn, Inc., Chicago, Russell B. Williams passed away February 10, 1948.

Through his contacts in advertising circles, Mr. Williams was well known in the Chicago area. However, he was best known to the readers of THE PAPER INDUSTRY AND PAPER WORLD for his regular monthly contribution which was published under the pseudonym, *William Sibley*.

Mr. Williams first began writing for *The Paper Industry* in January, 1924. Quite regularly, his short, timely items appeared under the featured head of "Editorial Comment on Timely Subjects." In December, 1927, that feature was changed to "Current Thought."

Mr. Williams is survived by his widow.

◆

▶▶▶ Salesman in the eastern states for The Lindsay Wire Weaving Company, Cleveland, for almost twenty-two years, *James W. Raines*, passed away suddenly at his Florida home on January 23. Prior to joining the Lindsay organization, Mr. Raines was superintendent for four years at the Provincial Paper Company, Thorold, Ontario.

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▶▶▶ For 15 years a stationary engineer for the Hinde & Dauche Paper Company at Sandusky, Ohio, *J. William Stone*, 63 years, passed away recently after a brief illness.

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▶▶▶ Chief erecting engineer of the Bagley & Sewall Company, *Laurence R. Stark*, passed away recently at Monte Alegre, province of Parana, Brazil. He was 66 years old. Mr. Stark had been in Brazil for the past two years supervising the erection of three paper machines at the Industrias Klabin do Parana, of Sao Paulo. During his connection with Bagley & Sewall, Mr. Stark had traveled all over the world.

▶▶▶ The owner of the Monadnock Paper Mills (Bennington, N. H.), *Arthur Johnson Pierce*, passed away January 8 at the age of 71. Mr. Pierce became a partner in W. T. Barker & Company in 1900. The firm was reorganized two years later as the Monadnock Paper Mills. Mr. Pierce owned a majority of the stock and was president for many years.

◆

▶▶▶ *Allan Lindsay Luke*, retired official of the West Virginia Pulp and Paper Company, passed away in Roanoke, Virginia, on January 21. He was sixty-six. The son of the late John G. Luke, founder of the West Virginia company, Mr. Luke occupied nearly a score of executive positions at the covington plant for more than twenty years, before retiring in 1929.

◆

BJARNE JOHNSEN

Dr. Bjarne Johnsen, director of laboratories at Hammermill Paper Company for the last thirty years, passed away January 9. He was sixty-three.

A native of Stavanger, Norway, Dr. Johnsen was educated in German and Swiss technical schools. He held a science professorship in Germany until 1909, when he went to Canada to do research work in pulp and paper at McGill University. In 1917, he went to Erie, Pennsylvania, to organize research work in pulp and paper at the Hammermill company and was appointed director of laboratories in 1919.

Dr. Johnsen was a member of the Technical Association of the Pulp and Paper Industry, the American Institute of Chemical Engineers, and the American Chemical Society.

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▶▶▶ A director of Waterbury Felt Company (Skaneateles Falls, N. Y.), *Thomas B. Rowlands*, passed away January 11 after an extended illness. Born in Clayville, he spent most of his adult life in the woolen textile business. He came to Waterbury Felt Company as assistant superintendent in 1907 when that company was founded. In 1909 he became its superintendent, serving in that capacity until his death.

◆

▶▶▶ Mexican representative of the International Paper Company, *Harry L. Borders*, passed away at a New York hospital recently at the age of 60. Mr. Borders was the founder of the old Standard Corrugate Box Company at St. Louis. In 1933 he became a resident of Mexico City where he represented the Southern draft division of the International company.

Here Were Made America's First Paper Boxes

In 1844 American jewelers were dependent on crude, costly imported paper boxes. Aaron Dennison of Boston decided that America needed a new industry, and that his father, Colonel Andrew Dennison, cobbler, of Brunswick, Maine, was just the man to start it. To Colonel Dennison, then 58, the idea of competing single-handed with European industries was a challenge. With his old shoe knife he cut out the parts from pasteboard and glazed paper. His daughters, Julia and Matilda, joined, pasted and finished the boxes, which found a ready market. Thus were made the first set-up paper boxes produced in America and thus began the Dennison Manufacturing Company.

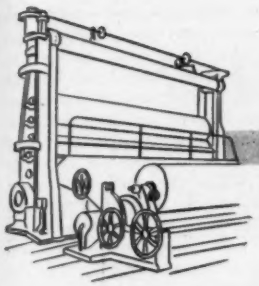
Today, paper boxes of every shape, size and character have become indispensable in the conduct of American business. They have played an important part in making paper the product most used by man.

For information on the first set-up boxes made in America, we are indebted to the book, "Paperboard and Paperboard Containers," by Harry J. Bettendorf. A copy of "Paper—Pacemaker of Progress," published by F. C. Huyck & Sons as a tribute to the Paper Industry, will be sent free upon request.

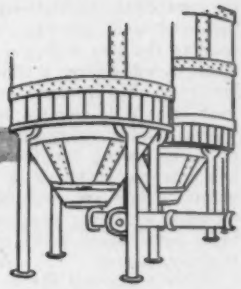
F. C. HUYCK & SONS · *Kenwood Mills* · ALBANY, NEW YORK

KENWOOD WOOL PRODUCTS

HUYCK *Felts*



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Safety Collar for Winder Shaft

The accompanying sketches cover construction and operation of a safety collar designed for use on a four-inch diameter winder shaft. The collar, as shown in Figure 1, is made up of two parts: the collar itself and a split bushing with retainer ring. In making the assembly, the bushing is clamped to close slot. Then the collar is pressed on until the retainer ring clears.

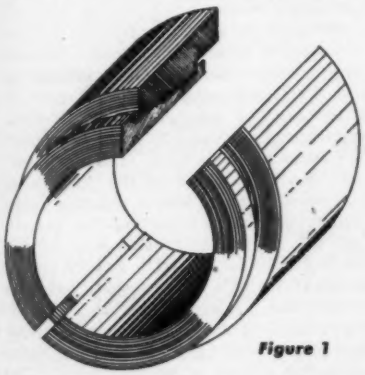


Figure 1

The collar is made of 6-in. O.D. by 4-in. I.D. hollow shafting.

Figure 2, a phantom view, shows the collar in use.

When the bushing is rammed, the collar is driven tightly against the paper roll. Collapse of shaft releases collar.

The rammer block is cut from 1-in. diameter plate in a shape to fit over shaft. The handle is a 1-in. diameter rod about 4 ft. long, bent up at end to give hand clearance when block is held square to bushing. Braces are of ½-in. diameter rods, and are welded to rammer block and handle.

In using this collar, no ropes are necessary. Therefore, the hazard of putting on a rope on each set of rolls that are turned up, is eliminated.—ELMER ANDERSON.

◆

Concrete in Cold Weather Construction

Construction operations now proceed throughout the year with little interruption due to cold weather. By suitable precautions concrete can be made during cold weather having the same qualities as concrete made at any other time. These precautions may include heating the materials, protection of concrete with suitable covers or heated enclosures, or the use of mixtures and materials known to produce the desired quality under the prevailing conditions.

During moderate weather, heating only the mixing water may be sufficient to provide normal hardening conditions. In very cold weather it is necessary to heat both water and aggregates. For ordinary building construction, the concrete should have a temperature above 70 Fahr. when placed. For heavy masses, the temperature may be somewhat lower. In no case should the materials be so heated that the temperature of the concrete is higher than 80 Fahr. when placed.

In any case the concrete should be protected to maintain sufficient heat for proper hardening. In general, it should be so protected that, when outdoor temperatures are near freezing, the concrete temperature is not less than 70 Fahr. for the first three days. In extremely cold weather it is desirable to provide protection for a somewhat longer period.

Coverings of suitable insulating materials help to retain the heat. A thick layer of straw, covered with tarpaulins, is often used. When left in place the forms also assist in retaining some of the heat. Where it is necessary to provide artificial heat to maintain suitable curing temperature, an enclosure heated with salamanders or steam may be used, taking care to keep the concrete from drying out. Canvas enclosures heated with live steam provide excellent curing conditions since moisture, as well as heat, is present.

High early strength concrete, secured with richer mixes of normal portland cement or with high early strength cement, may be used to produce the required strength under the temperature conditions prevailing or to reduce the necessary time of protection with covers and artificial heat. While calcium chloride may be used to accelerate the rate of hardening of concrete and thus reduce the time of protection, neither it nor other chemicals should be relied upon to reduce the freezing point of fresh concrete.—*Design and Control of Concrete Mixtures* (8th edition), PORTLAND CEMENT ASSOCIATION.

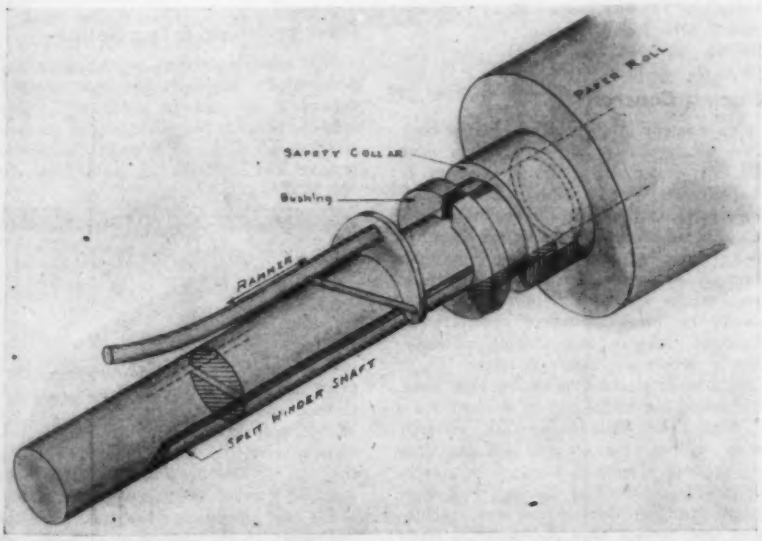


Figure 2—When bushing is rammed, collar is driven tightly against paper roll. Collapse of shaft releases collar. Rammer block cut from 1-in. plate to fit over shaft. Handle is 1 inch diameter rod about 4 ft. long, bent up at end to give hand clearance when block is held square to bushing. ½-in. diameter braces welded in

◆

Proper Installation Reduces Steam Piping Maintenance

When piping is properly hung and secured, there will be fewer steam leaks and less probability of an accidental injury. It is poor practice to rely upon joints and connections to hold piping in place. Shock and vibrations from waterhammer will cause the line to fracture at

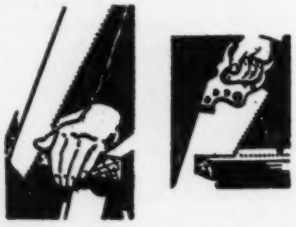
the connection. Such a fracture will injure personnel and interrupt production by flooding the area with live steam. In addition, it will present a difficult and costly repair job. To prevent pipe ruptures and joint leaks it is essential that the piping system be adequately provided with means of compensating for thermal expansion, i. e., expansion joints or bends. If expansion joints are used, they should be provided with limit stops to prevent their being pulled apart, which type of accident is always serious.

Leaky joints and flanges need constant maintenance. Immediate minor repairs upon discovery of a leak will eliminate need for a major repair job later. Leaks are a potential burn hazard to personnel. Furthermore, a drop of hot water dripping from an overhead joint upon the neck or head of an unsuspecting person below may startle him into an involuntary act which may result in serious injury.—*G. E. Coons, District Engineer,* AMERICAN MUTUAL LIABILITY INSURANCE CO.

◆

How to Use a Rip Saw

The position for ripping should be such as to permit long, easy strokes. The user who does most of the cutting with a few inches of blade, in the middle of the saw, has difficulty in keeping the line of the cut straight. He also dulls the saw more readily, because a few teeth are called upon to do all the cutting. Full strokes are desirable in both ripping and cross-cutting.



In ripping, the cut should be started with the finer teeth, at the point of the blade. Ripping usually is done with the work supported on saw horses, but if the board must be held in a vise, place it to give the proper cutting angle.

An angle of 60 deg. between the edge of the saw and the face of the work, as illustrated, gives best results when using a rip saw.—*Disston Saw, Tool and File Manual,* HENRY DISSTON & SONS, INC.

◆

Tips to New Employee

1. Before starting any machine, be sure you understand its operation and how to do the work safely.

2. See that all guards are in place. Do not remove any guard or make any safety device inoperative.

3. Wear goggles and the other protective clothing necessary on your job.

4. Your clothing should fit snugly. Loose or ragged garments, flowing ties, and jewelry are easily caught in machinery.

5. Follow safe practices. You never will be expected to do any job exposing you to danger, providing the work is done in a proper manner. Consult with your supervisor on any job that appears to have dangerous elements.

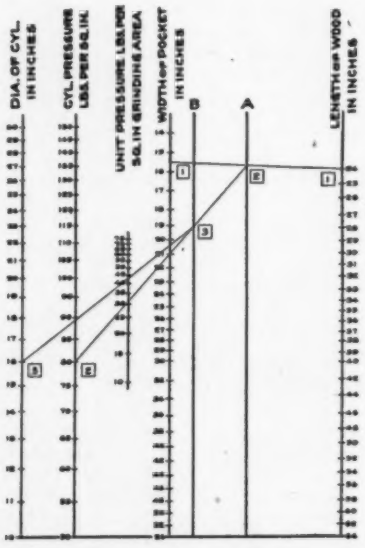
6. Report to your supervisor any unsafe or unsanitary condition you may notice about the plant. Management desires to make everything safe by removing the CAUSES of accidents. You can help! ERNEST DUTCHER, *Safety Engineer, Pioneer Div., The Flintkote Company.*

◆

Unit Pressure Chart for Wood Pulp Grinders

1. Draw a line (1)-(1) from "Length of Wood" to "Width of Pocket."

2. From point on "A" crossed by line (1)-(1), draw line (2)-(2) to "Cylinder Pressure."



. 3. From point on "B" crossed by line (2)-(2), draw line (3)-(3) to "Diameter of Cylinder."

4. Unit Pressure is indicated at point where line (3)-(3) crosses "Unit Pressure Scale."—NORTON COMPANY.

◆

Placing Concrete

No element in the entire cycle of concrete production requires more care than the final operation of placing concrete at the ultimate point of deposit. Before placing concrete, all debris and ice should be removed from the places to be occupied by the concrete and the forms should be thoroughly wetted (except in freezing weather) or oiled. Temporary openings should be provided where necessary to facilitate cleaning and inspection immediately before depositing concrete. These should be so placed that excess water used in flushing the forms may be drained out.

With a well-designed mixture delivered with proper consistency and without segregation, placing of concrete is greatly simplified; but even in this case care must be exercised to further prevent segregation and to see that the material flows properly into the corners and angles of forms and around the reinforcement. Constant supervision is essential to insure such complete filling of the form and to prevent the rather common practice of depositing continuously at one point, allowing the material to flow to distant points. Flowing over long distances will cause segregation, especially of the water and fines from the rest of the mass. An excessive amount of tamping or puddling in the forms will also cause the materials to separate. When the concrete is properly proportioned, the entrained air will escape and the mass will be thoroughly consolidated with very little puddling. Light spading of the concrete next to the forms will prevent honey-combing and make surface finishing easier.

In placing concrete in deep layers a gradual increase in the water content of the upper portion is quite certain to result from the increased pressure on the lower portions. The excess water should be worked to a low point, without actually causing a flow, and removed. It should be remembered that excess water in the upper layer is just as objectionable as excess mixing water.

Attention is called to the significance of a layer of laitance on a section of concrete. It has been a common assumption that if this laitance is completely removed all danger has been eliminated; in fact, specsifications frequently place considerable stress on its removal. Laitance, however, can only form from the presence of excess water, which means that the upper portion of the concrete will be porous, and the removal of a small layer of laitance still leaves several inches of porous concrete through which water will pass even under moderate pressure. The effect of this porous layer at the top of each day's work can be seen in many structures subject to water pressure. The lower portion of the layer is found to be hard and dense while the upper portion shows efflorescence due to passage of water. *Design and Control of Concrete Mixtures (8th edition),* PORTLAND CEMENT ASSOCIATION.

◆

How to Make a Tap Splice

This splice is used to tap a wire into a permanently installed line wire without cutting it. It may be made with either solid or stranded conductors, or a combination of both. To make the splice, remove one inch of insulation from the

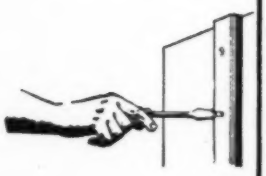
permanently installed wire and about three inches from the other wire. Lay the cleaned end of the tapping wire over the line wire. Make one wrap around the permanent wire with the tapping wire. Bring the end of the tapping wire across the standing part of the tapping wire, underneath the permanent wire, and with the remainder of the cleaned end of the tapping wire, place five close turns around the permanent wire (see illustration).—Shop Work (TM 11-453) WAR DEPARTMENT TECHNICAL MANUAL.

Use Screwdrivers Correctly

Do's

Use a screwdriver of a proper size to fit the screw being driven.

Use a screwdriver of good quality and with tip in good condition. Keep tool free from grease, dirt and burrs.

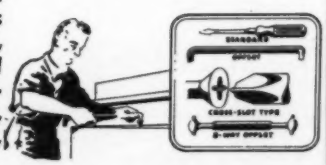


Grind tip of screwdriver so that it has a square edge and parallel surfaces for a short distance above tip, in order that it will not tend to twist out of screw slot. Wear approved type of safety goggles when dressing tools.

Always use a vise, or place work on a firm surface when using a screwdriver. Work held in the hand often results in injury if the tool slips.

Use a screwdriver only for driving or removing screws. It is not designed for other types of work.

Use screwdriver of proper design for work on hand. Screwdrivers come in many styles, each for a certain kind of job — standard, offset, cross-slot type, square shank, ratchet, etc.



Don'ts

Don't use a screwdriver with a blade too thick, too thin, or too wide to fit the screw slot correctly, as the blade may slip out and cause injury.

Don't use a poor quality screwdriver, or one with a broken handle or bent blade, or a chipped tip. Defective tools can easily cause injury.

Don't allow screwdriver tip to become worn or rounded. Never grind tip to a chisel point — this causes many injuries. Do not grind tip until heated enough to lose temper. Don't grind tools without wearing goggles.

Don't hold work in your hand, when using a screwdriver on it. Do not place the work on an unstable surface or any place that might permit it to slip.

Don't use wrong type of screwdriver on work requiring another type. Injury can be avoided by taking the trouble to get the proper type of tool.

Don't use a screwdriver for a lever, chisel, or punch. Don't strike the handle of a screwdriver with another tool, the handle may chip or split and cause personal injury, or damage to the tool.

Adapted from Industrial Safety Charts, Series L, U. S. Department of Labor

Convention-Papers . . . Abridged

The following abridgments are from papers presented at the annual meeting of the **Technical Section of the Canadian Pulp and Paper Association,** held in Montreal, Quebec, January 28, 29, 30, 1948.

Sulzer Blowers—Their Use in the Paper Industry

ROBERT THOMANN, Manager
Sulzer Bros., Ltd.

In Europe quite a number of paper-making machines are still running without suction presses and even without a suction couch. While the fitting of these devices always leads to increased dryness after the last press, in modern machines the improvement of water extraction is a more difficult matter. There remains, however, the interesting problem of raising the efficiency of this water extraction; it is then not only a matter of extracting the maximum amount of water, but of doing this with a minimum expenditure of power.

As you know, water was originally removed from the paper web by the use of suction boxes with barometric legs, later by reciprocating, rotary and other volumetric pumps, and finally by water-ring pumps. Water and air were drawn off at the same time, a procedure which inevitably entails a very low efficiency in the water-ring pump.

A decisive step was taken by Sulzer Brothers, who introduced turbo-machines in place of water-ring pumps.

The use of turbo-blowers was made possible only by the provision of highly efficient cyclone water separators, which permit the complete separation of water and air between the suction points of the paper machine and the blower. They enable the complete removal of water from the air drawn in.

The vacua required in paper machines depend to a large extent on the dry content of the paper web. The following values approximately cover the whole range of European practice:

	Inches Hg.
Wire suction boxes	4-8
Suction couch roll	11-20
Suction presses	15-20
Felt suction boxes	3-4
Felt washer vacuum boxes	6-8
Suction shoes of Vickery conditioners	11-18

The conventional arrangement provides either individual vacuum pumps for each suction point, which leads to quite an extensive pumping plant, or alternatively all the suction points may be connected to a central pump. In the latter case the pumps must always generate the highest vacuum required, and to enable the requisite vacua to be obtained at the different points air inlets or throttling devices have to be fitted. These, of course, cause fairly high losses.

With the Sulzer Turbair blower, on the other hand, central aspiration is possible without losses from throttling, since multi-stage machines are used. As a result, intermediate branches can be fitted and every suction point in the paper machine can be connected to a suitable branch of the blower. A central plant can be erected to operate almost without loss either with a single blower or with two blowers working in series or in parallel.

Figure 2 is a diagram of a plant of this kind in use with a paper machine having two suction presses. The various suction points, the piping connecting them to the central blower plant, the intermediate pre-separators, and the cyclone separators are all shown. The effective separation of air and water already mentioned enables the blower to draw in saturated air at the temperature of the paper stock.

During compression the air is heated and dried. It leaves the blower with a low relative moisture content, its dew point corresponding approximately to the water temperature of the wire part. The hot air can be used either for drying the felts or for heating the stock on the wire. Most commonly, however, it is added to the warm air used at the dry end. In this manner 80 to 90 per cent of the blower input can be recovered in the form of heat. The energy balance sheet of a Turbair blower plant is consequently very favorable by comparison with those for the systems used hitherto. Not only is a 30 to 60 per cent saving in the power input possible, but the majority of this lower energy consumption is recovered in its turn. Another point which should not be forgotten is that the hot air provided in this way is completely pure and free from oil, having been washed and filtered during its passage through the paper. In the blower itself it does not come into contact with any greased or oiled surface, since the bearings are fitted outside the body of the blower. The air may be used, therefore, without hesitation for the direct treatment of even the most delicate grades of paper.

The characteristics of Turbair blowers differ markedly from those of water-ring pumps, being much more favorable for practical purposes. The volumetric pump draws in an almost constant air quantity, quite regardless of the prevailing vacua, or, in other words, its delivery volume

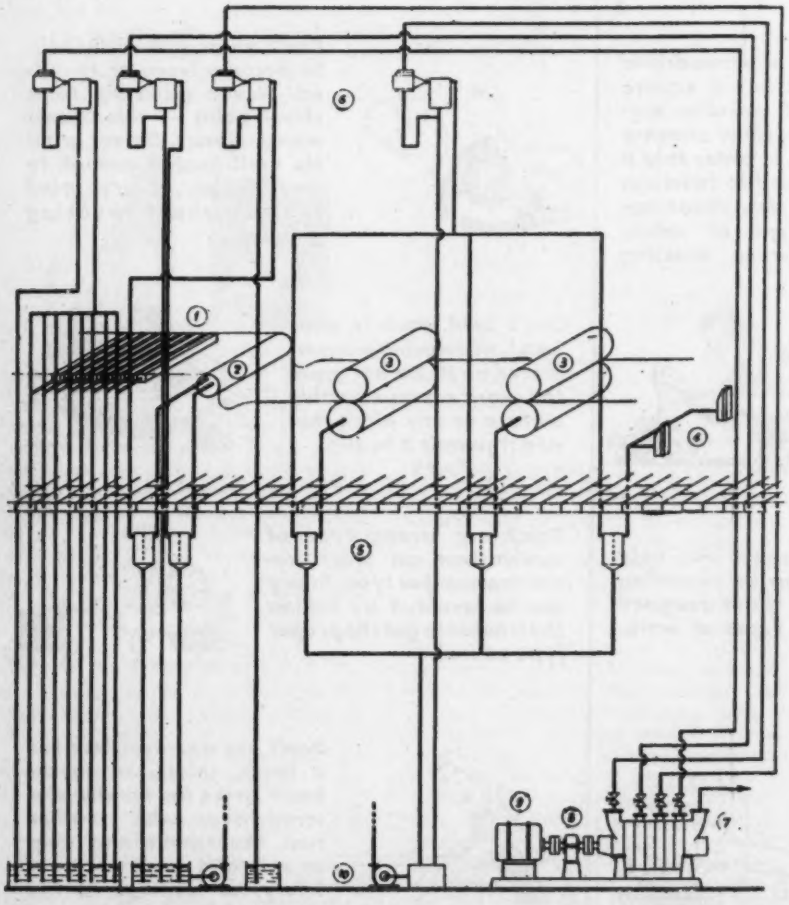


Fig. 2—Central aspiration for a paper machine by means of a Turbair blower: (1) Wire suction boxes; (2) Double-box suction couch roll; (3) Felt suction press rolls; (4) Vickery shoes; (5) Water separators; (6) Cyclone separators with safety separator; (7) Turbair blower; (8) Step-up gear; (9) Driving motor; (10) Pumps

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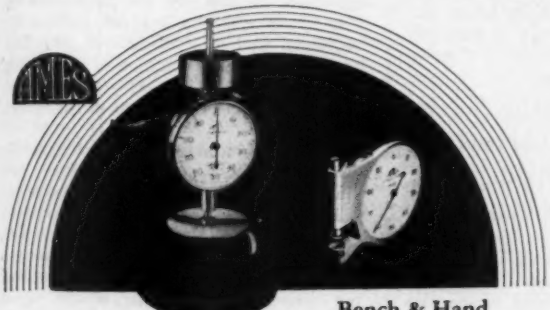

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characteristic is steep in the practical working range. Turbo-blowers have a much flatter characteristic, so that the quantity of air drawn in varies in accordance with the vacuum, decreasing when the vacuum rises and increasing when it falls. This is most interesting inasmuch as it corresponds exactly to the practical requirement of the paper machine. Heavy papers or those consisting of very slow stock, which have normally to be manufactured at low speed, require higher vacua and less air than light, porous papers. The latter can be run through the machine at very high speeds, but this demands the aspiration of much greater quantities of air at low vacua. The Turbair blower thus adapts itself automatically to the air requirements, whereas volumetric machines must be laid out and operated for maximum vacuum. A limited adaptability is obtained by throttling, but at the expense of efficiency.

The great differences in vacuum which occur in water-ring pumps increase the friction between the wire cloth and the wire suction boxes, and with it the output required of the driving motor for the suction couch roll. This has a very adverse effect on certain papers and naturally increases the wear on the wire. For this reason water-ring pumps usually have to be fitted with vacuum limiting devices, which again give rise to energy losses that can be avoided with the Turbair blower.

The Sulzer Turbair blower closely resembles a multi-stage centrifugal pump, and any mill engineer and maintenance man will at once be familiar with it. Its runners and blades have been designed in the light of the most recent disclosures of aerodynamic research and have been submitted to thorough tests in the laboratory. Every part is designed for uninterrupted operation, such as is customary in paper mill practice.

It is quite possible to connect a number of Turbair blowers in series, though it is sometimes necessary to install intercoolers in order to reduce the heating of the air and with it the power input.

In some cases, and in particular when the resistance of the felts fluctuates within wide limits, it is preferable to connect the wire and felt parts separately to the aspirating plant. In this case two blowers can be paralleled with a common drive.

The wire suction boxes and the suction couch are then connected to the blower for the wire part, the presses and the Vickery conditioners to the blower for the felt part. Another alternative is a common aspirating plant in which automatic regulators are provided in the suction lines from the presses in order to control the vacuum.

When used for the higher vacua employed in high-speed machines of medium size, Turbair blowers are fitted with plain bearings and may have as many as eight stages. Vacua up to 20 in. Hg. can then be obtained in a single casing.

Sulzers build three sizes of Turbair blowers with ball or plain bearings. These three sizes are quite sufficient for service with small and medium paper machines, which are the most common types in Europe. Machines with wire widths of over 120 in. require two blower sets connected in parallel, or otherwise turbo-blowers running at higher speeds must be used. The smallest Turbair, KRC 30, can be specially recommended for paper machines without suction couch roll, which thus have only wire and felt suction equipment. These are still quite common in Europe.

The various vacua cannot be determined in advance with any degree of certainty, as up to the present too few results are available with regard to the coefficients of paper resistances as a function of porosity, weight and dryness. It is easy to measure the vacuum during service; determining the quantity delivered is a much more difficult matter.

As a first approximate assumption, the following quantities of air, in cu. ft. per min. at the suction end, may be reckoned for each inch of wire width for newsprint and similar machines:

Vacuum in in. Hg.	11	15	18	20
(a) Suction couch roll, cu. ft./min.	7-11	9-14	10-16	13-20
(b) Suction presses, cu. ft./min.	3.5-5	5 4.5-7	5-8	6.5-10

The lower values apply to stocks with a mean freeness figure of 150 ml., the maximum values to a stock of 300 ml. Canadian standard freeness. These are rough values determined from results with various paper machines. They depend on many factors which differ from case to case, but in particular on:

(1) the quality of the stock (freeness)
(2) the weight, quality and condition of the felts used
(3) the temperature of the stock (viscosity)
(4) the dry content to be attained
(5) the quantity of paper to be manufactured, determined by: (a) the wire width, (b) the weight per unit area, and (c) the speed of the machine
(6) the number and dimensions of the wire suction boxes

The first experimental plant was put into service in the Netstal Paper Mill, Switzerland, in 1944; it was used with a machine having a wire width of 86 in. and equipped with a suction couch roll. Since that date, the blower has been in continuous service and has given excellent results. The only repair work needed has been the replacement of the coupling buffers; these, however, were originally supplied in an inferior wartime quality. In 1945, a second blower came into operation in the same mill and has run up to the present without giving the slightest trouble.

Economy naturally depends directly on the prices of fuel and electric power and thus differs from plant to plant. In another Swiss paper mill, for instance, the power input for four water-ring pumps had been 345 hp. The blower which has now replaced them requires, 260 hp. or in other words, a saving of 25 per cent (85 hp.) has been made. The hot compressed air leaving the blower at 284 Fahr. is mixed with the warm air supply to the dry end and cooled down to 95 Fahr., so that 88 per cent of its heat is recovered. In this way, the equivalent of 0.88 by 260=230 hp. is saved, making an additional saving of about 300,000 Btu per hour. On the assumption of a working period of 7,000 hours per year, the cost of the plant can be redeemed in two years at the most.

Today ten blowers are in operation in Switzerland alone and fifty others are under construction. As with all new developments, a few troublesome early problems had to be solved, but these were limited to the hearings and the transmission gearing. The layout of the plant and the arrangement and size of the separators naturally had to be investigated not only on the test-bed but also in industrial service. These are questions which still

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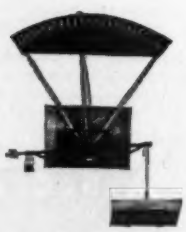

WALL TYPE BASIS WEIGHT SCALES

22

have to be examined carefully in each particular application, with due regard for the individual circumstances on site.

Swedish firms also have begun to take an active interest in the blower, and the first two units in that country were put into service at the end of 1947. Further blowers are at present being built for France, Algiers, Germany, Jugoslavia, Argentina, and Brazil.

The cellulose industry is also an interesting sphere of application for Turbair blowers, which can there be used, as much as they are in paper machines, for water extraction from the cellulose.

Moreover, the vacua and suction quantities are here lower than in paper machines, so that no new problems arise. Trials are at present being carried out with Turbair blowers in two Swedish cellulose factories, and there is every reason to expect that they will be brought to a satisfactory conclusion.

The Lime Manufacturing Process

VICTOR J. AZBE, President
Azbe Corporation

To make lime is one thing. However, to make good chemical lime cheaply and in the great quantities demanded by industry is still another.

Rather than simple, the process of lime manufacture is, in its various ramifications, so highly complex that it is actually elusive. Somehow it is impossible to attain a complete grasp of it and only the relatively uninformed imagine themselves masters of the subject.

Intricately involved as the process really is, we still must be pragmatical in its treatment and so this paper presents the subject broadly in its more practical details.

The purpose of a lime kiln is essentially the dissociation of calcium carbonate and of such magnesium carbonate as may be present, to calcium and magnesium oxide. In many chemical processes using lime, magnesium oxide is useless and can be considered an impurity together with silicious, aluminous, ferrous and other incidental minerals. It is the calcium oxide, free and unimpeded which ordinarily is desired.

When limestone is contaminated in quality even in only a very small amount, if calcination temperature is not controlled the resulting lime is disproportionately impaired. Consequently, it is not only a matter of burning, but control of this burning, through control of temperature and time of calcination.

A lime kiln of any type, either vertical or rotary, is essentially a heat transfer apparatus. If it is arranged for orderly heat transfer, its fuel efficiency will be high and if in addition it is also arranged for a high rate of heat transfer then capacity will be high as well.

Poor functioning of the preheating and cooling zones, the escape of overly hot gases and drawing of hot lime can readily reduce the kiln efficiency by half. There are other possible losses, of course, due to radiation, incomplete combustion, or excess air, but ordinarily they do not nearly equal in harm the improper zonal functions of the kiln itself.

Temperature control of flame is not simple to accomplish. Some seem to think that by merely giving it more or less fuel would solve the problem, but that is not the case. Flame temperature can be controlled through excess air or, through incomplete combustion, but such practice is indefinite in application and leads to a considerable fuel loss. In some cases flame is tempered with steam, or lime is deliberately drawn with core, but these are wasteful processes also. Delayed progressive combustion is sound if it can be accomplished.

Recirculation of kiln gases is fair, but "hot zone recirculation" is the soundest method. By this latter system a portion of the gases are withdrawn from about the end of the dissociation zone and re-introduced in the hottest portion of this zone. In principle the withdrawal must be from the dissociation zone and reintroduction at the temperature of withdrawal, because then there is no heat loss. It is merely mixing up the too hot and the too cool regions.

Many of the old type vertical kilns had a capacity of only ten tons of lime per day Today kilns of hardly any greater size have a capacity of from forty to as high as ninety tons of lime. This high capacity is made possible through various mechanical draft systems, which may be forced, induced, or combined in balanced draft.

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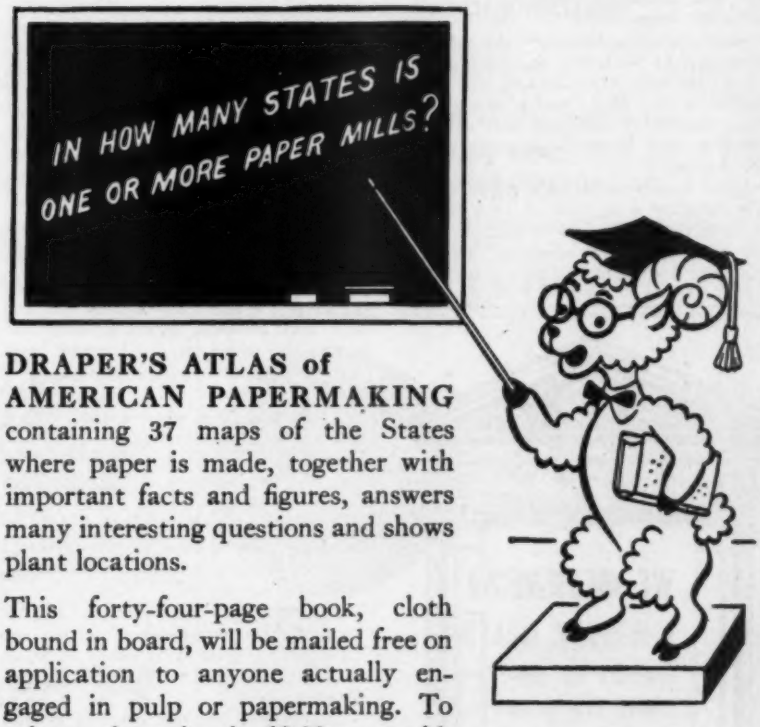

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In addition, there is the recirculating system for temperature control.

Virtually all vertical kilns of the gas-fired type built in the last decade or longer are of the center burner variety developed by the writer. They may vary in size as well as in arrangement to suit different fuels, capacity requirements and nature and size of stone.

Often such kilns are built with integral gas producers located immediately adjacent. These integral producers are by now highly developed and virtually automatic in operation. They are of deep fuel bed type and so produce exceedingly good gas. The close coupling of producer and kiln is conducive to better efficiency and simpler control. As fuel, either coal or wood may be used.

In larger plants, up to now, a centralized gas producer was usually installed from which gas was led through suitable flues to a series of kilns. Which is better, this centralized or the integral system, is still not completely decided, but with continual improvement of the integral producer, it seems that soon the integral system will be the better. More ready and precise gas distribution control and elimination of the long, costly, clumsy gas flues, creative of soot and soot disposal nuisance, may likely be responsible for this change.

Stone may be 4 in. to 8 in., 3 in. to 6 in., 2 in. to 4 in., or 1 in. to 2 in. All of these can be burned in vertical kilns but each require a somewhat different kiln. The 1 to 2 in., or even 2 to 4 in. could not possibly be calcined in the kiln intended for 4 to 8 in. stone.

For the largest stone the highest kiln is required, reducing progressively as stone size decreases. Then while with large stone only a single center burner with two rows of ports is used, with smaller stone there is a progressive elaboration until with the smallest there are three center burner systems and eight rows of ports to assure that every portion of the bed receives the required amount of heat.

Small stone kilns have other special features such as division of the hot zone into many almost entirely separate units to prevent gas or stone cross flow. Thus, the medium stone kiln consists of virtually six small units and that for smallest stone has eight units independent of each other in respect to both drawing and firing control.

Of the fuel systems there is the integral gas producer, not only for coal but also quite suitable for wood gasification, particularly hogged fuel; there is the mechanical gas producer, or improved system of direct coal or gas firing; there is the natural gas kiln. Lately pulverized coal application to vertical kilns is also reviving.

In the past when there was small stone to burn it was almost always necessary to resort to a rotary kiln, but that now is changing and for small capacities the Ellernan kiln is now available. For larger outputs we are installing plants having kilns of special design capable of producing lime at a very high capacity rate and at a fuel efficiency which a rotary, no matter how much improved, could never attain on account of its basic manner of operation.

It may seem that where a wet slurry is involved a rotary kiln would be essential; however, briquetting systems in conjunction with vertical kilns of special unitized design would do it better.

Also the Loomis-Dorr system is developing in a very promising manner by means of which finely granulated masses are reburned in suspension.

But regardless of what is coming we do now have rotary kilns and we will have still more, so it behooves us to do whatever we can to better their performance.

If a vertical kiln was operated as most rotary kilns are, without a stone preheater and without a lime cooler its performance also would be very poor indeed. In its case, however, such auxiliary zones are more readily and naturally possible. To apply preheaters and coolers to a rotary kiln of a kind that would serve the purpose in an adequate degree is not nearly so simple, and hence most frequently it is not done. The result is a very simple but also a very inefficient installation.

Assuming that limestone is burned to 95 per cent CaO (calcium oxide) content, 2.6 million Btu are required per ton, which equals approximately the heating value of nineteen gallons of oil. But many rotary kilns even on dry process operate with a consumption of eleven million, this being 88 gallons per ton, or an efficiency of less than 25 per cent. Contrasted with this the author believes that thirty gallons operation is possible in the case of vertical kilns and forty gallons for rotary kilns.

The rotary kiln performance suffers mainly from these three ailments: inadequate waste gas heat recovery, inadequate lime heat recovery and radiation loss.

It would seem that the radiation loss would be the most difficult but actually is the simplest to control. If the kiln is improved in other respects so its length can be made less or if its capacity is increased, the radiation loss percentage of total heat input drops off greatly.

If possible, kilns should be operated at the highest capacity even if waste gas temperature rises. They seldom are, usually due to draft limitations, the errors of which can often be readily corrected. The more air that passes through the kiln, the more fuel can be injected and the more lime will be made. And more will be made, if the air and fuel are thoroughly and properly mixed by turbulence.

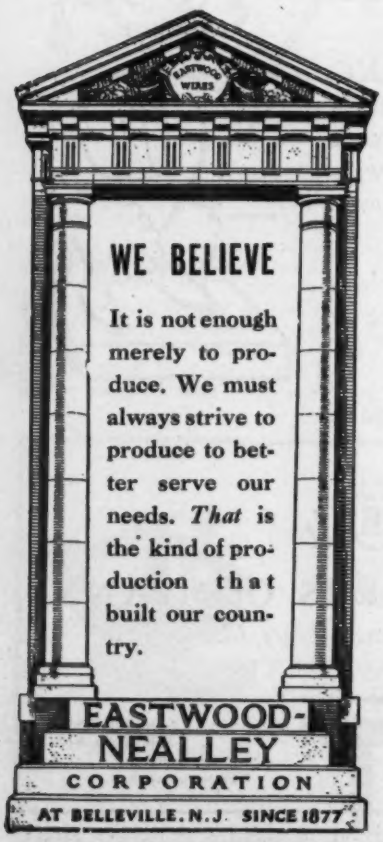
Rotaries should not be placed at too much of an incline as that reduces the load and reduces the rate of rotation. A high load is desirable to give adequate time and a high rotation also to bring ever fresh masses to the surface and to exposure to heat. However, the higher the rotation the lower the load except when dams are incorporated. In one case of a kiln with which the author has something to do, the load is very heavy even though rotation is 35 to 40 seconds per revolution. Capacity is 235 tons although the kiln is only 175 ft. long. Shell diameter is 9 ft., which the outlet dam reduces to only 5 ft. diameter.

Load should be heavy all up the kiln and hence other dams may be desirable. Certainly a dam at the inlet is called for so that a heavy load can be carried all the way back without causing spillage. However, this rear dam, combined with the feed pipe passing through, often reduces the draft within the kiln at the feed end to nothing, which in turn reduces the capacity.

Dams must be balanced with kiln rotation; a high dam and low kiln speed do not agree, particularly if there is a great difference in the stone size. Stone size should be as uniform as possible. The smallest should be half the size of the largest stone.

There should be an effort at flame control for either long or short flame. Two systems would be better, one for distant projection and one for closer in burning. Only the closer would be regulated and that in accordance with the sort of lime discharged. It would be a turbulent very hot steam of a mass inversely varying in dimension with the degree of completeness of the lime burn. Control can be automatic.

Ordinarily pulverized coal or oil firing is used for rotary kilns. Gas producers have virtually been abandoned. However, in some localities wood is plentiful and producers may again be considered. Even with very wet wood they are practical, provided the kiln is equipped with a cooler, which recovers most of the heat of the lime for combustion air preheating.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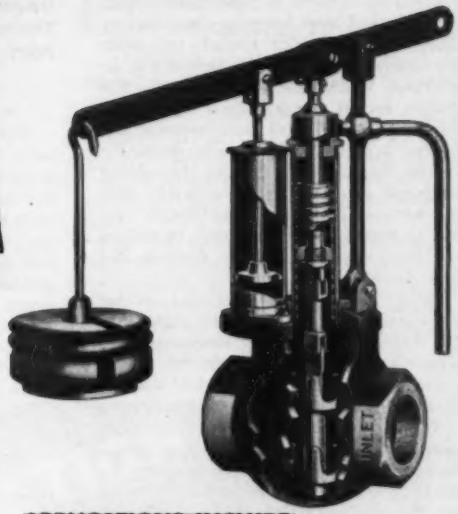

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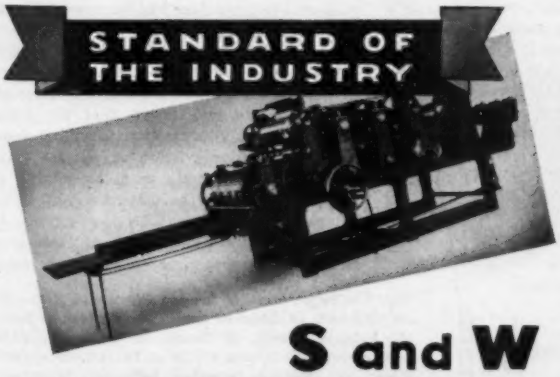

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Ordinary coolers of plain noninsulated rotating shell type are just about useless. They do not abstract enough and waste too much heat. They are simple but ineffective. When lime is granular the best coolers are of direct contact type. Such coolers for very small sized material and limited capacity can be quite small. For coarser lime and high capacity they should be larger so as to contain sufficient cooling surface. There are many designs aiming at avoidance of dust and control of the flow distribution of air upwards and lime downwards.

When material is not granular, so that air cannot well be blown through, then the rotary cooler becomes almost essential. There is the planetary type but the author considers it inadequate and too wasteful in heat.

Lime cooling is important and stone preheating is also but the greatest gain is from both together, more so than the additive amount of the two alone. If stone is not preheated with heat of low temperature elevation, it is with the high. Then since this withdraws the equivalent amount of heat from the calcining process, correspondingly less lime is made and in turn less heat is available to recover in the cooler.

If the preheater works but the cooler does not, then the more the preheat saves the more the cooler wastes. In this particular case the only gain is in the preheating of the CO_2 portion which reverts in the kiln.

If combustion air and excess air are not preheated in the cooler with the sensible heat of the lime, they are preheated with the heat of high elevation to the calcination level, resulting in correspondingly less lime being made. With less lime being made, less stone passes down the preheating section when even an effective preheater fails to give a low terminal temperature. It all is strangely interwoven, but in general one may say that the cooler is the more important.

Into all this, water of the slurry enters but little; its evaporation takes place in a separate zone at a high temperature difference. The effect is that stone starts to preheat later; that is, the true kiln becomes shorter, which is harmful, but in ordinary kilns there is such a great surplus of heat that it is not as harmful as one may expect. However, in a more efficiently arranged kiln there is little surplus heat; then the harm becomes considerable since the slurry holds much water and to evaporate water requires much heat. If one aimed at a really efficient installation then it would seem that the sludge from the filters should be pressed to briquettes which would reduce the amount of water by a considerable amount.

Disposal of Wood Refuse at Thunder Bay Paper Co. Limited, Port Arthur, Ontario

T. C. ANDERSON
General Superintendent

Wood room refuse in most mills is used as a fuel, either in furnaces specially designed or as a supplement to coal in the same furnace. Regardless of the firing method the problem resolves itself into one of processing the refuse to produce a fuel as low as possible in moisture content and of a physical condition which promotes rapid and complete burning. This paper describes the development of a satisfactory system evolved by Thunder Bay Paper Co. Limited, Port Arthur, Ontario.

When the mill started operation in 1926, refuse processing employed a Nordstrom drying tower. This is a piece of machinery, in design excellent, in operation far from satisfactory insofar as the particular installation was concerned. During the period of its use refuse was handled, but usually at a cost.

In 1944, it was decided to discontinue the use of the dryer and install a bark press and shredder. Accordingly a Northern Foundry six roll, type C bark press and a Jeffrey 36 by 30 type A shredder were purchased. This equipment was set up after the manner detailed in the diagrammatic layout, Figure 1.

By the addition of a shredder before the press, it was hoped that more uniform distribution of bark to the press and hence more effective water removal in the press would result. Insofar as the press was concerned, the system worked satisfactorily but it was immediately evident that experimentation would be necessary to make the shredder operative.

Based on the information obtained from trial runs, it was decided to relocate the shredder in a position following the bark press. The location decided upon is shown dotted in Figure 1. The following results were predicted:

1. Improved operation of the bark press
2. Disintegration of the bark wads discharged by the press in a condition more suitable to combustion
3. Decrease in the amount of fines in the wood room waste effluent
4. Elimination of plugging in the shredder discharge

The first three predictions were borne out fully and the fourth in part. It was found that with all hammers installed and only the most rearward section of cross bars in place, the discharge still tended to plug. This was due in part to the relatively steep angle of the belt which carried away the shredded material. However, it has been found that only half the hammers are required to produce a product altogether acceptable as fuel, insofar as condition is concerned.

After this satisfactory solution of the shredding problem had been devised, attention was directed toward improvement in press operation.

The use of a spreader on the press inlet resulted in a more uniform feed across the inlet roll nip, with resulting improvement in moisture removal. This simple spreader consists of a piece of two inch standard pipe with three ¼ inch thick by ½ inch high strips welded to it longitudinally. The pipe is supported on a through shaft with brass bearings. The spreader shaft is welded to the conveyor frame with the spreader roll across the press inlet, its long axis parallel to the direction of travel of the feed belt and bisecting the flow of bark being discharged from the belt. It turns alternately to right or left, deflecting the bark along the inlet roll face.

Heretofore, slasher sawdust, chipper dust and hogged fuel had been sent direct to the boilers. Experimentally, these wastes were mixed with the wet bark and passed through the press. As a result the percentage moisture of the mixture at inlet and discharge was below that for bark only. There is an objection to taking sawdust and chipper dust at 43 per cent moisture, for example, and, by mixing it with bark, raising the moisture content to 60 per cent or more. The disadvantage is more than offset by the resulting "sweetening" and loosening up of the bark mass,

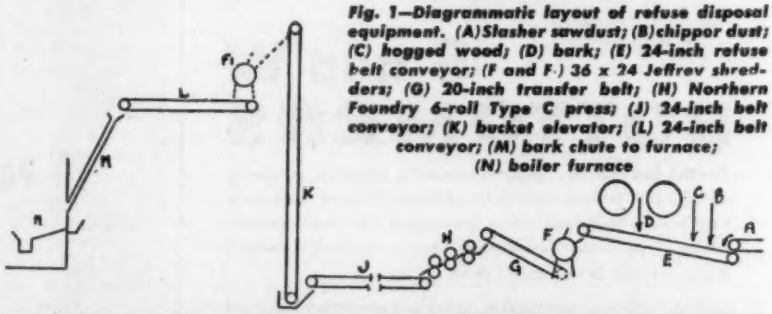

Fig. 1—Diagrammatic layout of refuse disposal equipment. (A) Slasher sawdust; (B) chipper dust; (C) hogged wood; (D) bark; (E) 24-inch refuse belt conveyor; (F and F-) 36 x 24 Jeffrey shredders; (G) 20-inch transfer belt; (H) Northern Foundry 6-roll Type C press; (J) 24-inch belt conveyor; (K) bucket elevator; (L) 24-inch belt conveyor; (M) bark chute to furnace; (N) boiler furnace

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particularly during shredding. The saving in conveying equipment is also to be considered.

The bark press drive, as installed, produced a surface speed of approximately 30 fpm on the center rolls. The press was slowed down approximately 16 per cent by changing the driving V-belt sheave for one of smaller diameter. This decrease in speed increased the bark loading on the press since the bark tended to pile up at the inlet. Reduction in speed produced an improvement in moisture removal and for the first time water was observed to be running from the third or discharge set of rolls.

The manufacturer equips each top roll with a metal ductor to clean the grooves between the teeth. As a result, there is undesirable wear on the roll and more particularly on the ductor itself, necessitating fairly frequent conditioning of the latter. A simple ductor can be made by clamping square hardwood fingers between two pieces of two inch plank, five inches wide. The fingers are positioned by spacers also held between the planks. The assembly is bolted on brackets to the machine frame in the same position as the metal ductor. As the fingers wear, a tap with a hammer brings them into contact with the roll face again.

To summarize, the method of disposal of bark and wood refuse at this mill consists of the following: Bark from two drums is sluiced to a bull screen equipped with drags. Here the sluicing water is drained off. This bull screen discharges to a 24-inch rubber conveyor belt, onto which also is fed the slasher sawdust and chipper dust, the latter having been picked up by a fan and passed through a cyclone. Hogged wood is also included at times, but if the run is heavy it is handled manually and dumped into the system after the press. The 24-inch conveyor dumps to a second inclined belt conveyor which discharges to the bark press inlet. The pressed refuse is picked up on a 30-inch belt conveyor extending under the discharge rolls and emptying to a 24-inch belt conveyor leading to the power house. At the power house, the refuse discharges from the 24-inch conveyor to the foot of a bucket elevator. This elevator carries the material up to a point above the fuel charging floor, from which point it is chuted to the shredder inlet. A trap door in the chute provides a means of by-passing the shredder. A 24-inch belt conveyor picks up the shredded waste which is carried along and scraped from the belt at four points into chutes discharging on the rear of the furnace fuel bed.

Burning of the refuse is complete with no apparent detrimental effect on the efficiency of coal combustion. The fines can be seen to ignite before hitting the fuel bed. Fly ash from the refuse fuel has not been noticed, even under conditions of above normal boiler load and consequent increase in furnace draft.

Bark from 600 cords of watered wood per day has been handled quite easily this past season. From the experience gained to date there is no reason to doubt the ability of press, shredder and furnaces to handle double this quantity of refuse.

Maintenance on the press has been surprisingly low, and has been confined to reconditioning of roll ductors and changing of piston washers. Shredder repairs also have been minor, consisting of the changing of hammers or cross bars when damaged by some foreign material as iron scraps or stones. Labor cost is not excessive. Two men at base rate are employed as attendants, one on the press and one on the shredder.

Fuel savings have been appreciable, ranging from the equivalent of ten to nineteen tons of coal per day, depending on the amount and condition of the refuse.

A New Method of Proportioning Slush Pulp

R. M. BISHOP, Control Supt.
Anglo-Canadian Pulp & Paper Mills Ltd.

The ratio controller has been used effectively in the chemical process industries to measure the rate of flow in a pipe line, and control the rate of flow in a secondary line, at some predetermined ratio.

Such an instrument, the Fischer and Porter ratio controller, has been adapted for use with sulphite and groundwood stocks to control the furnish to a mixed stock chest supplying two newsprint ma-

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chines. This instrument operates in conjunction with two rotameters to measure the rate of flow in the sulphite stock line, which is manually controlled, and to control the rate of flow in the groundwood stock line.

The Rotameter

The rotameter consists of two parts: a tapered metering tube and a metering float. When no fluid is flowing, the float rests at the bottom of the tapered tube and blocks it almost completely. When flow commences and the fluid reaches the float, the buoyant effect of the fluid lightens the float but is not sufficient to lift it. Therefore, since the tube is blocked, fluid pressure starts building up. When the fluid pressure and the fluid buoyant effect exceed the downward pressure due to the weight of the float, it rises and floats.

As the float moves up the tapered tube, an annular passage is opened between the float and the tube. The float rises till this passage is large enough to handle all the fluid and then comes to rest at the equilibrium point, where the fluid velocity pressure plus the buoyant effect equals the float weight.

An increase in flow causes the float to rise higher in the tube, and a decrease causes it to sink. Every float position corresponds to one particular flow rate. Hence by providing a means of determining the position of the float, one can determine the rate of flow through the tube.

Metering

The floats are of stainless steel as are the tapered tubes or sleeves. Both the float and sleeve are streamlined to prevent stock build-up.

The float in the sulphite Ratosleeve carries an extension in which is located an iron core armature. This armature moves within electrical transmitter coils which form two branches of an impedance bridge circuit. Any movement of the armature affects the electrical impedance balance of the bridge. This balance is transmitted to receiver coils in the control instrument. The receiver coils then cause their compensating armatures to assume a new position, restoring the null balance of the bridge. The compensating armatures are connected to the pen arm through a balance beam which causes the pen to move in step with the Ratosleeve float.

Any movement of the Ratosleeve float in the groundwood line works through a similar telemetering system, causing the groundwood pen to move to a position corresponding to the Ratosleeve float.

Each balance beam actuates a cam, which thus follows pen position. An integrator follows this cam, integrating pen position, and giving a reading convertible to gallons of fluid or tons of fiber per interval of time.

Proportioning

The balance beam for sulphite and the balance beam for groundwood are connected by a proportioning link. Manipulation of the ratio selector dial varies the take-off between this proportioning link and the pilot mechanism. Then for any setting of the ratio selector, a change in sulphite flow will cause an unbalance in the pilot mechanism, altering its output air pressure to the control valves and so changing the opening of the butterfly valve on the groundwood line. As the groundwood flow approaches the desired value, the pilot mechanism is affected by the groundwood balance beam through the linkage arms, and the air supply to the groundwood control valve is readjusted to the desired equilibrium point.

If now the position of the ratio selector is changed, this unbalances the pilot mechanism, altering the groundwood valve opening. As the flow of groundwood changes, the pilot mechanism is adjusted until equilibrium is reached at the desired flow.

Operation

The mixing room operator controls the flow of stock to the mixed stock chest by adjusting the valve on the sulphite line. If the chest level alters, the operator adjusts the sulphite valve, and the flows of sulphite and groundwood change in proportion.

A refinement being introduced is to control the sulphite valve by a level controller actuated by the level of the mixed stock chest.

If the flow of either stock is interrupted, caused for example by pump failure, a warning light comes on, and a horn blows.

Extension sight tubes are being installed on each Ratosleeve, so that in event of electrical failure, or instrument failure, the flow of stock may be controlled manually. This obviates the need for by-pass valves and piping.

Inspection ports are also being provided to afford easy access to the inside of the instrument for periodic checks.

If a change of furnish is desired, it is only necessary to change the ratio adjustment dial.

Calibration

Calibration tests were carried out over weekend shutdowns. The procedure on both sulphite and groundwood stocks was to pump from storage, through the instrument to an empty chest. The amount of stock pumped was then calculated from the dimensions of the chest. Consistency samples were taken throughout the runs, and the time and integrator increment were noted.

This instrument was installed as an experiment, and as such has been satisfactory. It provides a very flexible operating setup, particularly with regards to automatic control. Experience gained with this instrument has shown what modifications are necessary. The present instrument will be modified so that constant integrator factors can be obtained over the whole range. On future instruments it is felt that by decreasing the range of flows the instrument will handle, the relationship between sulphite and groundwood flows may be kept linear.

Abridgments in this section are from papers presented at the Second Engineering Conference of the **Technical Association of the Pulp and Paper Industry** held in Philadelphia, November 3-5, 1947.

The Suction Roll of Today

H. C. MERRITT, Chief Engineer
Downingtown Manufacturing Company

In appraising today's suction roll it is well to consider the history of its development. The idea is old, patents dating back from fifteen to sixty years include the basic elements of modern design. It did not reach a place of importance until comparatively recent years for two reasons: first, the operating speeds were so moderate that plain rolls filled most requirements satisfactorily, and second, availability of materials and manufacturing methods hampered its development.

With the increase of machine speeds came an increase in desirability of suction rolls and a corresponding increase in incentive to the manufacturers to solve the problems inherent in their manufacture.

The first and most serious problem involved the production of a noncorrosive shell of uniform physical characteristics at a reasonable cost. The development of centrifugal castings solved this problem and marked the starting point of active suction roll application.

The first suction rolls were carried on large ring bearings, the sleeves of which were shrunk on the shell and were driven indirectly through a ring gear also mounted on the shell. This arrangement was cumbersome and space consuming and, in addition, permitted only moderate nip pressures to be applied, thus robbing the suction roll of much of its usefulness. The advent of the direct driven roll permitting the use of high capacity bearings with consequent high nip loads marks the second step forward in the development of the modern roll.

At about the same time the present spiral drilling pattern was developing to overcome scoring of the interior of the shell and to form a pattern whereby the proportion of hole area and land at the nip line is nearly constant.

This was followed by the application of the rubber cover to the shell to avoid shadow marking and to soften the action of the hard bronze shell on the felt with a consequent increase in felt life, the latter being by far the most important factor today.

These comprise the major factors in suction roll development but they have been accompanied by many mechanical refinements, such as the substitution of spring supported adjustable deckles and sealing strips of the Bakelite resins for laminated rubber, the development of the cantilever couch made possible by the direct drive to bring us to the modern roll as we know it.

The suction couch roll, first application of the suction roll, is today almost universally used on all except certain specialty machines. More recently the dual box couch has been introduced. This provides a wide low vacuum box followed by a usually narrower high vacuum box, thus achieving maximum water removal

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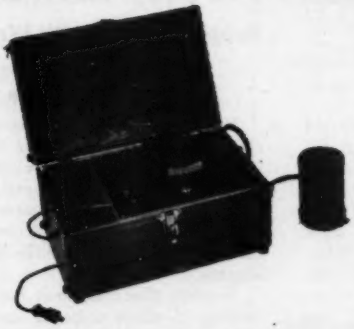

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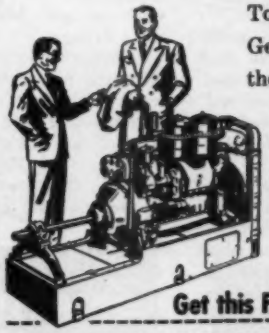

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with minimum vacuum pump capacity and less drastic action on the sheet.

A further recent development is the primary suction couch installed at the start of the wire incline to the main couch.

The advantages of suction rolls in their various forms is, of course, a dryer sheet permitting higher speeds and safer pressing.

The suction drum roll was an early suction roll application which still has its place on certain cylinder machines. The modern roll has a very wide box and countersunk holes. It has been modified by the application of a top roll forming the suction drum press.

The suction extractor roll closely parallels the function of the suction drum roll or drum press. The suction extractor differs from the drum roll or drum press in that, while the latter must apply its vacuum to the sheet through a felt, the suction extractor applies its vacuum directly to the sheet itself. Used in conjunction with the plain extractor it has given excellent results.

The advantages of the suction drum roll or press and the suction extractor roll are a dryer sheet, partial elimination of plain primary presses, bulkier sheet, reduction of top felt picking, elimination of crushing and blowing, increased felt life and increased production.

The suction press roll has developed through the years until today it is almost essential on every machine. In its present rubber-covered state it contributes materially to safe and speedy operation of the machine, and is suitable for operation at any speeds now in use or in process and is capable when so specified of nip pressures of 300 to 400 pounds per inch. The advantages gained by use of the suction press are a dryer sheet, elimination of wet streaks, increased production, increased felt life, longer intervals between wash-ups and heavier pressing without sheet damage.

While the suction press roll will aid materially in preventing the felt from filling up, auxiliary equipment for cleaning felts has long been found necessary. The suction felt cleaning roll serves this purpose. This is a small diameter, light roll with countersunk drilling and is widely used on both cylinder and fourdrinier machines.

The suction cylinder couch roll was developed to replace the conventional rubber covered couch roll over the cylinder mold. It is at present a wire faced suction roll with a comparatively wide box which eliminates the pond usually present at the nip of the plain couch, assists in couching the sheet from the mold and delivers a much dryer sheet than the plain couch. The development of this roll for all types of applications is not yet complete, but its usefulness has been amply demonstrated and experiments now under way should enable us to complete its development shortly. When installed, it must be accompanied by a suitable cylinder mold drive.

The use of the rubber-covered suction roll as a pressure roll against a Yankee dryer has been made with distinct advantages. While it is unlikely that it will remove much water, it has eliminated wet streaks and further, it eliminates blowing at this point by removing air.

Heating Water with Waste Heat

L. G. JANETT, Sales Engineer
J. O. Ross Engineering Corp.

There are several proven methods of recovering heat from paper machine exhaust vapors, probably the most efficient of which is that of direct heating of water. Before going into the mechanisms of water heating itself, it would be well to examine the potential uses of the heated water obtainable.

A point where steam is used for direct heating of water or paper stock is a possible application for heated water. The following applications of hot water from heat recovery systems are currently in operation in a number of mills:

1. Oliver filter showers, in lieu of steam heated water.
2. Fresh water head box showers.
3. Fresh and white water wire showers.
4. Fourdrinier, to prevent winter freeze-up of suction presses due to high vacuum and low water temperature.
5. Cylinder molds, to raise mold effluent temperatures from 40-64 deg. Fahr. in one case.
6. Filter plant mixing basin to raise winter water temperature improving the floc obtained with greatly reduced alum dosage.

There are additional potential uses that can be examined, including the following:

1. Heating log ponds in cold climates.
2. On barking drums to reduce steam usage.
3. Pulp washing.
4. In beaters using wet lap pulp.

Any particular paper machine installation must be designed around the quantity of water to be heated, the entering water temperature and the quantity and quality of the hood exhaust air. Some general observations of the conditions encountered can be made.

First, the question of a Briner Economizer must be considered. In a cold climate where a Briner Economizer is required, a water heating system must be so designed to allow for a portion of recoverable heat to be reserved for air heating. The fresh air heating possibilities need not be materially reduced by the addition of water heating equipment, although the quantity of water that can be heated will be somewhat less.

Second, the initial temperature of the water to be heated and hood exhaust temperatures must be considered. With low water temperatures just above freezing the thermal head between water and air is large, and accordingly the recoverable heat is relatively large.

Third, the type of water to be heated must be considered. White water in general indicates the need for a scrubber type of air washer without nozzles to overcome clogging difficulties. Fresh water requires the use of spray type washers or cooling type finned coils for heating water if a closed system is required. The coil type system of indirect heating of water has a greatly reduced heat transfer coefficient and can be justified in some special cases to heat boiler feed, for example, where abnormally high hood exhaust wet and dry bulb temperatures obtain.

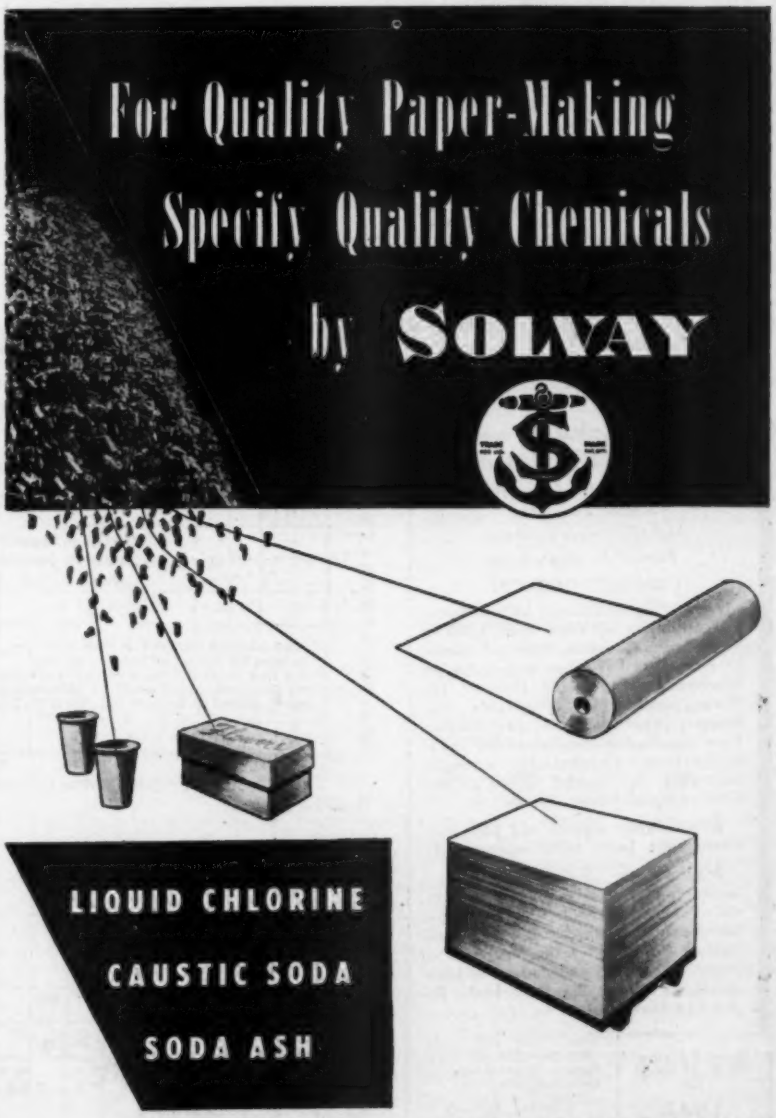
Where white water is to be heated without any economizer system, it is entirely feasible to use one, two or three stages of scrubbers with the water flowing from one to the other in a counter current manner to arrive at substantially the same water temperature rises without the use of nozzles.

There are several companies which regularly build cooling towers with some standard type of filling that can also be adapted to heat recovery of this type. Several different types of cascade towers are adaptable for heat recovery.

When operating the scrubber type of equipment, it is quite essential that proper consideration be given to the design of the wiers and sumps to prevent undue clogging of the drains with white water fiber, and to prevent turbulence that will cause excessive foaming as much as possible. The eliminator plates on scrubbers must also be provided with ample access for cleaning.

When heating white water it is quite essential that proper consideration be given the materials of construction of equipment. The centrifugal wheels in a scrubber should be built of stainless steel and the scrubber housings can very advantageously be built of a corrosion resistant metal such as stainless iron, which is a high chromium, low carbon iron, with no nickel. This metal has an effective resistance against most alkaline conditions. It should also be borne in mind that if any slime conditions obtain in the white water system this problem will also be involved in a scrubber, although the condition should not be serious unless the white water system is completely closed.

The first consideration that must be examined when contemplating heating of water is that of the points of usage and the quantity of heated water that can be used in a particular mill. In general, it would seem desirable to establish a use for not less than 50 to 75 gallons per minute for any small tonnage machine before considering water heating. This statement would apply to either white water heating or fresh water heating. Second, the temperature of the entering fresh water to a heating system must be considered. If the fresh water temperature exceeds 60 to 65 Fahr., it may prove to be a border line application for heating fresh water, unless the hood exhaust wet bulb temperatures are particularly high. Normal white water entering temperatures will be higher in general and multi-stage type scrubbers can be considered. Third, the quantity and quality of the hood exhaust air must be examined for a particular machine. If the hood exhaust volume is excessive and the machine is operated with very low steam pressures, such steps must be taken to carry as high wet bulb conditions as are feasible with respect to room operating conditions and in some cases the exhaust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quality may not be high enough to effect a worthwhile heat saving, although such cases would be rare. In general, any paper machine exhaust air will provide sufficient heat for effective water heating. Fourth, outdoor weather conditions have a bearing on the amount of recoverable heat. For example, in a moderate climate where outdoor temperatures are relatively low and humidity is low, the quality of hood exhaust will be correspondingly lower, affording less recoverable heat, particularly if excess exhaust volumes exist from the machine hoods.

Supercalender Roll Deflections and Crowns

J. B. GOUGH, Chief Engineer
The Mead Corporation

This paper discusses three methods of analyzing and calculating the theoretical deflection, crown, and crown shape of supercalender rolls.* It also deals with the effect of these factors on the duty and performance of supercalenders. Particularly, it stresses their effect on uniform finish across the width of a supercalender, calender cuts, snap-offs, and broke.

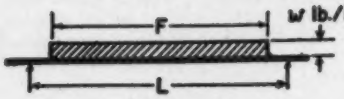


Figure 1

Formulae 1 and 2 include the effect of journal overhang on both crown and crown shape. They neglect only the very minor deflection due to horizontal forces and shear.

Curve A in Figure 2 shows the shape of the crown curve obtained with Formula 2 for a .050-in. crown on a 200-in. face cast iron bottom roll of normal diameter and stiffness. Curve B in Figure 2 shows the crown shape of the same roll when the calculation is based on a parabola in x^2. In this latter case the additional effect of journal overhang is also neglected.

Curve B almost coincides with a true circular arc. Curve A gives about 0.0015 in. too much crown at about 30 in. from end of face, and Curve B about 0.003 in. too much, when compared with Curve C.

Consideration is given to the horizontal deflection due to friction at nips and bearings of all rolls in a 10-roll supercalender stack. The rolls in the stack were made up of a 30-in. cast iron top roll, three 14-in. cast iron and five 20-in. fiber intermediate rolls, and a 36-in. cast iron bottom roll. These rolls had a 157-in. face. The nip pressure was 2400 lb.; the speed, 1200 fpm; the drive, a 300-hp. motor.

The power requirement corresponds approximately to a friction coefficient of .005 at journals, and of .024 at nips. Neglecting horizontal deflection, Formula 1 gives a crown of 0.824 in. on the top roll and of .0524 in. on the bottom roll.

$$\delta = \frac{5\omega F^4}{384EI} + \frac{\omega F^3}{32EI}(L - F) \qquad (1)$$

(Refer to Figure 1)

Where the second term on the right hand side of the equation represents the added deflection due to the overhang of the journals, which is appreciable and should not be neglected. Both the nip pressure and roll weight are assumed to act over the whole roll face.

δ = Deflection of the roll at the center of the face, in inches
D = Outside diameter of roll in inches
d = Inside diameter of roll, in inches (if hollow)
I = "Moment of Inertia" of roll in inch units

$$I = \frac{\pi}{64}(D^4 - d^4)$$

F = Face of roll, in inches
L = Distance between center-line of self-aligning bearings, in inches
E = "Modulus of Elasticity" of roll material C.I. = 15,000,000 St., = 30,000,000 (app.)
ω = Nip pressure in pounds per inch of face ± weight of roll per inch of face

---

(*) In a written discussion of this paper, Dr. R. G. Minarik, Kimberly-Clark Corporation, points out that a "sine" forming crown mechanism on a roll grinder will produce Curve A quite exactly if cam rotation is limited to about 70 to 75 deg. of the possible 360 deg. available in one revolution. Similarly, a rotation of about 90 to 95 deg. will produce Curve C.

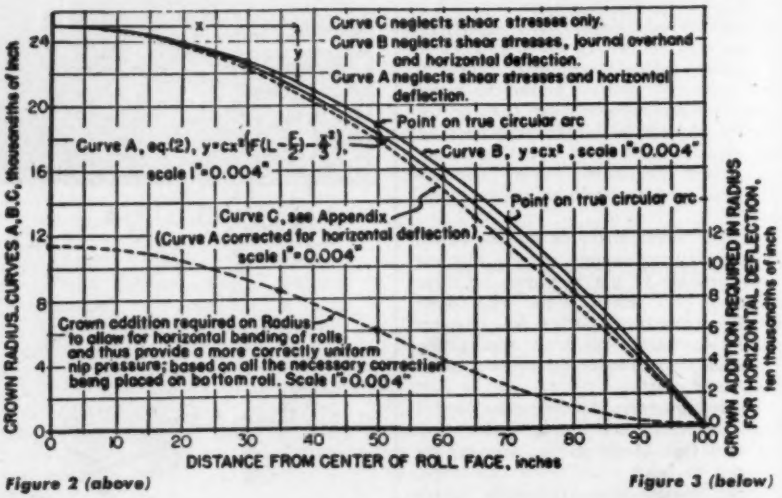
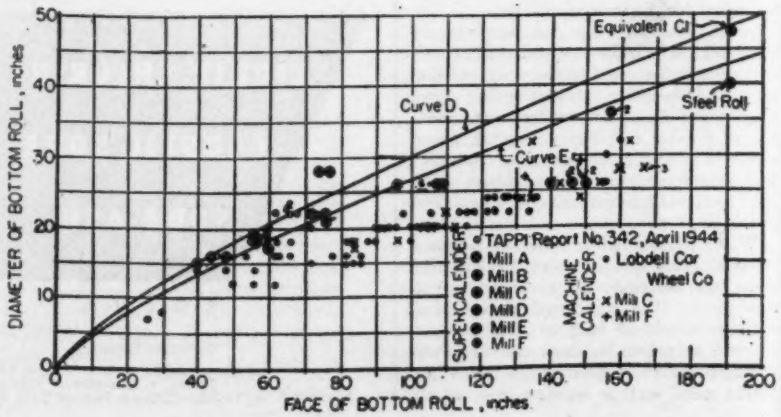

Curve C neglects shear stresses only.
Curve B neglects shear stresses, journal overhand and horizontal deflection.
Curve A neglects shear stresses and horizontal deflection.
Point on true circular arc
Curve A, eq.(2), y=cx²{F(L-F/2)-x²/3}, scale 1"=0.004"
Curve B, y=cx², scale 1"=0.004"
Point on true circular arc
Curve C, see Appendix (Curve A corrected for horizontal deflection), scale 1"=0.004"
Crown addition required on Radius to allow for horizontal bending of rolls, and thus provide a more correctly uniform nip pressure; based on all the necessary correction being placed on bottom roll. Scale 1"=0.004"
CROWN RADIUS, CURVES A, B, C, thousandths of inch
CROWN ADDITION REQUIRED IN RADIUS FOR HORIZONTAL DEFLECTION, ten thousandths of inch
DISTANCE FROM CENTER OF ROLL FACE, inches

Figure 2 (above)

Figure 3 (below)



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The horizontal deflection on all rolls, due to the horizontal frictional forces, requires that the bottom roll crown of .0524 in. be increased .000872 in. in order to obtain more nearly uniform nip pressures across the face of the stack.

Curve C in Figure 2 shows the approximate change in shape of crown Curve A due to horizontal roll deflection for a very similar 200 in. stack. Below Curve C is a reproduction of the crown addition due to horizontal bending, at ten times the scale

$$y_x = \frac{wx^2}{8EI}\left\{F\left(L-\frac{F}{2}\right) - \frac{x^2}{3}\right\} \quad (2)$$

Where x = Distance from center of roll face, in inches. (Note: origin at center)

Yx = Deflection, also half the crown, at point x, in inches. All other factors being the same as for equation (1)

of Curve C. This blow-up in scale is to show more clearly the "sine" form of the crown addition due to the horizontal bending of all rolls.

This latter curve, based on Formula 2 and the horizontal forces involved, is modified by Formula 3. As stated previously Curve A gives .0015 in. too much crown at approximately 30 in. from end of face, and Curve B, .003 in. too much at the same distance. If the effect of these horizontal roll deflections is neglected, a very minor crown error will result, but there is the possibility of a major shape error and of some lack of uniformity in nip pressures and sheet finish across roll face. If all rolls in stack are horizontally and alternately offset an appropriate amount to balance the horizontal forces due to friction, Curve A will need no correction.

Generally, actual crown on top and bottom rolls is not more than 66 per cent of the theoretical crown as calculated by Formula 1. This condition is due in part to crown on intermediate rolls, crossed rolls, and the difficulty of feeding sheet into first nip with reduced nip pressure while starting. An odd number of rolls in a stack would appear preferable where both the top and bottom roll crowns are either too great or too small; and an even number, if the crown of either one of these rolls is too great and the other too small.

A 157-in. 10-roll stack due to calculated roll deflections and crowns will stretch the edges of a sheet 0.138 in. or slacken them 0.036 in. These changes in linear dimensions will depend upon whether the eight intermediate rolls are cast iron or steel.

Figure 3 shows the relation between the diameter and face of the bottom roll for a number of actual supercalenders, as well as some machine calenders.

It is reasonable to assume, if the crown per inch of face is constant, that this relationship of diameter and face for all cast iron rolls should be somewhere between Curves D and E.

$$C = (E^2 + A^2)^{1/2} - E \quad (3)$$

Let E = Sum of radii of both rolls; in contact before horizontal bending

Let A = Sum of horizontal deflection of both rolls, say at center of face

Let C = Total clearance between rolls, say at center, after bending and before crowning

Systematic Operation of Construction and Maintenance Departments

C. LEE DRYDEN, Manager
Central Plant Engineering Dept.
Marathon Corporation

The well-known higher costs of today for construction and maintenance work in our mills require that we introduce methods of operation to take advantage of every cost saving possible in operating these departments. In order to know what and where these costs are and to have the machinery to eliminate or reduce them to reasonable operating standards, we must first properly organize our construction and maintenance forces with clearly marked lines of authority and responsibility of supervision from management level down to the newest apprentice or helper. Second, after being satisfactorily organized, the department must be operated in accordance with the organization plan. Third, with the departments properly organized, with job descriptions, duties, and responsibilities known by all of its personnel, the organization must then be integrated by a system of operation and

furnished with working tools consisting of forms and records.

The organization can consist of a department containing separate divisions for construction and maintenance functions. In larger mills and plants this is sometimes a practice.

The dispatcher is a key figure in the systematic operation of construction and maintenance work. In the absence of a full-time dispatcher, the dispatcher's position may be filled by the plant engineer or any other individual designated by him to handle the dispatcher's duties.

A smaller mill or plant or one where construction work may not be the major factor may have its construction and maintenance functions integrated as a single division. The position of dispatcher in such a case is equally as important as in a mill where these functions are separated.

With the organization ready for operation the next step is to introduce the work order form as one of its tools. The work order is always initiated by the dispatcher upon the request (usually telephoned to the dispatcher) of any authorized person in a production department or any other department of the mill or plant. The dispatcher shall receive all requests for construction, maintenance, repair, rearrangement, engineering, building service, lubrication, or any other work confined within the policies, work rules, job descriptions, duties and responsibilities of the engineering department.

Only in cases of extreme emergency such as fire, flood, etc., when the requester cannot supply all the information required by the dispatcher should a work order be issued without complete answers to the following questions being supplied:

1. What is the requester's name?
2. What is the inventory or unit number of the machine, equipment or item for which work is requested?
3. What is the location, name and description of the machine, equipment or item for which work is requested?
4. What is the full description of the work to be done?
5. If this is repair work, what is the known cause of the trouble?
6. What is the absolute maximum time in which this job can be scheduled for completion?

The dispatcher will receive all requests for weekend work on the "Plant Engineering Weekend and Holiday Work Request" by noon each Thursday. He shall submit these to the plant engineer for approval and scheduling.

The dispatcher will receive all calls for engineering service regardless of the cost of items involved. He will, together with the requestor, make a preliminary estimate of the job insofar as it is possible at the time the request is made. Should it be determined that the cost will not exceed established limits permitted for capital expenditure or for rearrangement, maintenance or repair work and does not involve any engineering, he will issue a work order as requested.

If the dispatcher has determined that a job request will exceed work order cost limits or involves any engineering, he will refer it to the plant engineer and immediately inform the requestor of the action taken. Upon receipt of a request of this nature the plant engineer will review the request, survey the job and take the necessary steps to enable conclusive action to be taken.

The dispatcher will issue separate work orders for each section, trade or craft required to complete the request. For instance, a job requiring only electrical maintenance work will require a work order to be issued directly to the electrical section. A job involving more than one trade, such as rearranging a machine or equipment, may involve millwrights, electricians and pipefitters. In this case, a separate work order will be issued each to the pipefitter, millwright and electrical sections (in instances where one craft section requests minor work to be done by another, such as the machine repair section requests work to be done by the welding section, the work order issued to the machine repair section will be sufficient authority for the welding section to perform the requested work. . . .)

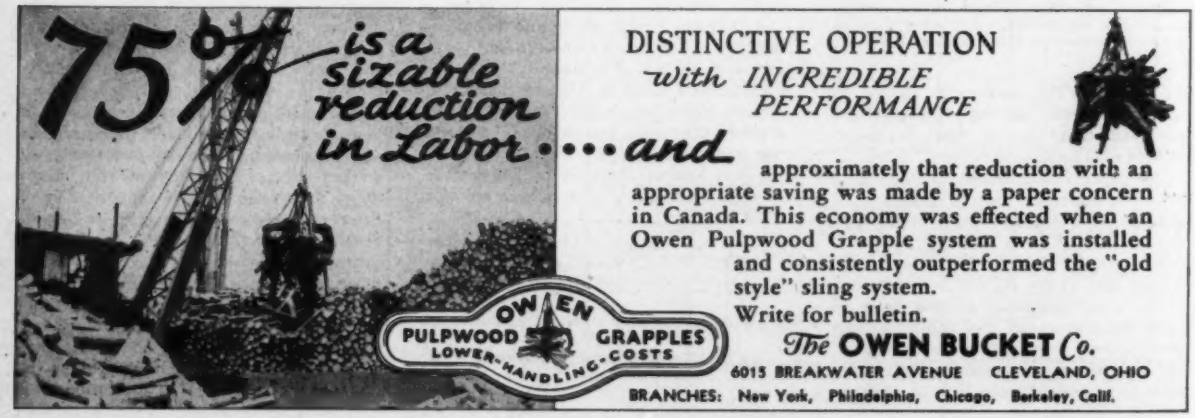
The work order copies will be distributed by the dispatcher as follows: The original (white) will be issued to the crew chief of the section responsible for the work involved. The first copy (pink) will be forwarded to the plant accounting department. The second copy (blue) will be forwarded to the supervisor of the cost center such as a machine center, plant section, plant, factory, department or division from which the request is received. This copy is a source of information to the cost center supervisor that the work order has been requested and is to be performed as indicated on the work order form. This copy should be filed in a current file until the job is completed. The third copy (yellow) will be filed in the dispatcher's "active" file and held in this file until the return of the completed original copy.

There may be times when a dispatcher will route the work order through the plant engineer, or a member of the engineering staff, for consideration or review of some unusual aspects of the job. The work order may be issued to an inspector when it is a preventive maintenance job under the jurisdiction of the inspector.

After the requirements of the job are known, all necessary preliminary work is completed and the work order has been fitted into an approved schedule for the section, the crew chief will either perform the work himself or assign it to a qualified mechanic or mechanics, apprentices and helpers.

The dispatcher will be located adjacent to the sectional location blackboard. This board will list the names of all employees, groups and sections according to craft or trade. After each employee's name there will be a space wherein may be written the number of the work order on which the employee is currently working. When an employee is given a work order on which to work, he will generally mark in the space after his name the number of this work order. When this is not possible, the number will be written in by the crew chief or the dispatcher or some other designated employee. This number is to remain on the board until the job is completed and work order is returned to the crew chief.

While it is necessary and desirable that the work order form be handled in the foregoing manner, there will be occasions when emergencies will cause the dispatcher to contact the plant engineer, master mechanic, chief electrician, other crew chiefs or mechanics in some part of the plant by telephone or inter-communicating system and relay the work order information, together with the work order number, verbally; thus, the work may be got-



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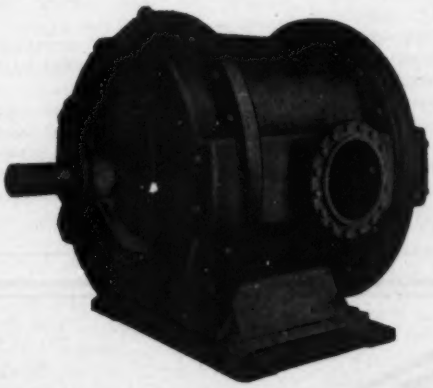
ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES



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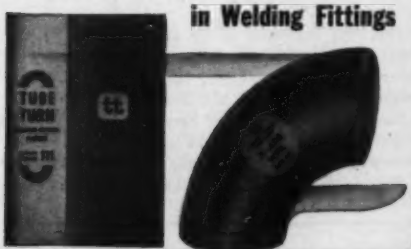
NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

WHAT'S NEW?

in Welding Fittings



GET THIS BOOKLET—The Tube-Turn line of welding fittings is BIG, and still growing! This 20-page Supplement to TT Catalog No. 111 gives you data about important new items which, more than ever, make Tube Turns your *one source of supply for all welding fitting requirements.*

tt

TUBE-TURN—
T. M. Reg. U. S. Pat. Off.

TUBE-TURN WELDING FITTINGS AND FLANGES

District Offices at New York, Philadelphia, Pittsburgh, Detroit, Chicago, Houston, Tulsa, San Francisco, Los Angeles

Tube Turns, Inc., Dept. 5101, Louisville 1, Kentucky

Please send me a copy of Tube-Turn Catalog No. 111 Supplement.

Name.....

Position.....

Firm Name.....

Street.....

City.....*Zone*...*State*.....

ten underway before the work order form can be properly filled out and delivered to the mechanic in accordance with this procedure. In cases of this kind when the work order is issued, the dispatcher will write in the information that it is a confirmation of the verbal order that he has already issued with the time and name of the employee to whom the verbal order was issued. The completion of the work order will be handled in the regular manner.

The plant engineer will hold daily "schedule meetings" attended by all crew chiefs and affected members of the staff of the engineering department. This daily meeting is for the purpose of scheduling work orders which have been issued and are to be fitted into the activity program for the time when each job is requested. It will not be necessary to schedule routine or small jobs but all major jobs will be so scheduled to meet the requirements of the work order and balance out the man-hour capacity available in the plant engineering department. This is usually done at 11:45 each morning to permit prompt adjournment with the 12:00 noon whistle.

After the job is completed the mechanic or mechanics who have been performing the work will write in on the work order, reverse side, the description of the work done and the cause of the trouble, if repair work, and any suggestions or thoughts on what can be done to prevent the trouble from occurring again. They will sign their names for "Work Completed" and date on which the job was finished. When it is convenient for any member of the crew who has worked on the job to do so, he will secure the signature of the cost center supervisor for whom the work was done. When it is not convenient for the mechanic to secure this signature it will be done by the crew chief or inspector. The completed work order form is then returned to the crew chief.

After checking the work order and the job to see that the requirements of the work order have been fulfilled, the crew chief or inspector will sign approval and indicate the date. If it has not been convenient for the mechanic to do so, the crew chief will secure the approval signature of the cost center supervisor for whom the work was done. The completed work order form will then be placed in the "completed" pigeon hole at the location blackboard for pickup by the dispatcher at the end of the shift.

After the work order is completed according to its requirements, the original (white) is returned to the dispatcher by the crew chief or inspector the same day that work is completed. Should the work order take more than a day in completion, the dispatcher will collect all outstanding work orders, with the completed work orders, and transcribe from them a summary of the work order numbers, number of hours worked and authorization numbers for each employee in the engineering section for that day. The dispatcher shall enter this summary on a daily time report and return the uncompleted work orders to the sectional crew chiefs, inspectors, or mechanics from whom they were received. He shall forward the daily time report to the plant accounting department before 10:00 a.m. the following work day.

Upon completion of checking of the completed work order the dispatcher will transmit the information from each work order to the machine and equipment history card and building history record in accordance with the description of the work requested and performed. After completion of these history entries, the dispatcher will forward the original work order form to the plant engineer and will remove from the "active" file the third copy (yellow) and transfer it to the "completed" dispatcher's work order file.

The plant engineer or a designated number of his staff will review the completed work order forms checking the total number of man-hours against the work performed as a general measure of the effectiveness of the engineering or maintenance department and he will note the suggestions carried on the reverse side for action to be taken.

Upon the completion of this check (which will take only a few minutes for the average number of work orders completed in one day) the plant engineer will forward the completed work orders to the plant accounting department for their disposition. This should be done each day not later than 10:00 a.m.

The plant engineer shall periodically audit the machine and equipment history cards and the building history records and check the frequency and cost of the construction and maintenance items accumulating against the machinery, equipment and buildings of his plant.

This systematic operation of construction and maintenance departments will:

1. Eliminate costly duplication and confusion of having more than one order or request issued for the same job.

2. Avoid misunderstanding, garbled instruction, failure of orders to reach proper mechanics in time for prompt repair, and other costly time-consuming causes resulting in unauthorized or ill-informed persons from production departments informally requesting work to be done without use of proper channels.

3. Afford an immediate means to cost center supervisors to check costs of each job and impose reasonable limits of control for the supervisors to assist the plant engineering department in maintaining better working efficiency.

4. Better serve all construction and maintenance requirements, especially expediting emergency work.

5. Secure high quality of workmanship.

6. More readily reveal "idle" time with this control.

7. Afford means for scheduling of all construction and maintenance working forces and readily accessible knowledge of the maintenance of this schedule.

8. Permit positive operation of any type of preventive maintenance program.

9. Maintain knowledge of current distribution and location of all members of the construction and maintenance department for immediate availability for emergency.

10. Keep cost of construction and maintenance available for determining operating costs of fixed assets, true comparative costs for future estimates and information available for more correct budgeting figures.

11. Permit cost of construction and maintenance to be controlled by each job instead of periodic averages.

12. Make available to the engineering supervisor a source of practical information of job experience that could not be secured except through this type of systematic operation of maintenance and construction departments.

ENGLISH ECCO CLAYS TRADE MARK CLAYS

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INDUSTRIAL MODEL
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pH METER

- Direct-reading.
- Operates from any AC line outlet.
- Completely portable. Electrodes are integral parts of the instrument.
- Accurate to .10 pH.
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Ideal for suction box covers, suction pipe covers, forming boards, doctor blades, and all types of water, oil or grease lubricated bearings. Write for details on any specific bearing application.

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Hydraulic Mounting Technique for Roller Bearings*

A. STEWART MURRAY
Asst. Chief Engineer
SKF Industries, Inc.

In the process of developing a rigid coupling that was adequate, removable, and practical, SKF developed an oil injection method that greatly simplified the making and breaking of heavy interference fits.

The method is based on the fact that friction between contact surfaces of a pressure joint, during assembly and disassembly, can be almost entirely eliminated through the injection of oil under pressures of 5,000 to 30,000 psi, the required intensity varying with specific pieces and their respective functions. Experiments have shown that by this use of oil, friction between contact surfaces can be reduced to 1 to 2 per cent, and less, of that which would otherwise prevail.

The contact pressure that exists between two parts, in which the bore of the outer piece is smaller than the outside diameter of the inner piece, may be calculated with reasonable accuracy. The shrinking of a heated outer piece onto an inner piece causes no reduction in the amount of measured interference such as occurs at assembly by cold pressing and the inevitable shearing off of metal. The resultant contact pressure after cooling is more precisely described as the shrink fit pressure. The magnitude of the shrink fit pressure can be calculated according to formulae dealing with thick-walled cylinders. When a hydraulic pressure exists between a tapered bore piece and its mating tapered journal, there is a component axial force tending to push the outer piece down the taper. The magnitude of this force is equal to the projection of the area of the journal contact times the average pressure across the length of contact. Experience has indicated that the "uphill" axial force necessary to advance a tapered bore outer piece up a tapered journal is consistently 120 per cent to 130 per cent of the "downhill" value derived as a component of the shrink fit pressure calculated according to the formulae dealing with thick-walled cylinders.

When dismounting, a tapered bore piece from its seat pressure is applied to the bore only and generally results in the piece being freed from the tapered seat so completely and uniformly that it becomes desirable to provide a safety stop to prevent possible injury to people and damage to equipment from overtravel, particularly when the axis is horizontal.

The oil injection removal method has already been put into practice. The bottom roll of a calender bearing mounting is typical of its ease of application and lack of conflict with other mechanical features. In the process of assembling a calender, the erection crew drove one of the bottom roll bearings too far up the taper. The assembly was being made without oil to reduce the friction and the bearing had been very firmly seated after considerable effort, and then inspection revealed that too much of its internal clearance had been removed. Instead of the situation being a very delaying mistake, the oil injection method quickly dismounted the bearing. The bearing not only came off, but overtravelled considerably because of the horizontal axis and the lack of any safety stop.

The paper industry's wide use of tapered bore bearing mountings makes it possible for them by adding the necessary oil holes and grooves, to take as full advantage of this method as though the equipment was originally so equipped.

While this hydraulic method is most effective with parts having mating tapers, it is of great help in dismounting bearings with cylindrical bores. In a specific case concerning a bearing with a 6 in. bore and mounted with a measured interference fit of .0028 in. on a cylindrical journal, the initial starting resistance varies between 50,000 and 60,000 lb. when removed by pressing or pulling. When dismounted by the oil injection system a force of a few pounds stripped it from its seat with the exception of the final ½ in. Usually a straight bore bearing will not come completely off its seat because an oil film cannot be sustained by too small an area. Accordingly, the bearing hangs on the edge and we have used a press to

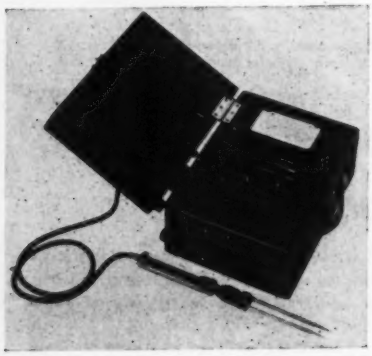
(Turn to page 1676)

(*) For clarity, this abridgment carries some revisions of original text made by author.

NEW EQUIPMENT AND SUPPLIES

Electronic Moisture Meter

Thwing-Albert Instrument Co., Penn Street and Pulaski Ave., Philadelphia 44, Pa., has announced a battery-operated moisture meter for determining the percentage of moisture in paper, straw, wood, and a variety of other materials. Standard calibrations are from 4 to 50 per cent, and ranges can be extended in either direction as the need for such scales arise. The reproducibility of the moisture meter results are claimed to compare favorably with oven testing.

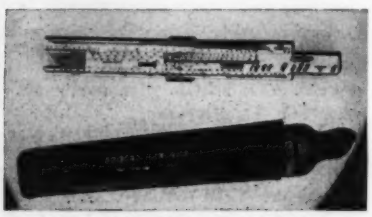


Tests are made by pushing the points of a probe into the material, or holding the points against a surface with a steady pressure. Indications are immediate—the electrical resistance changing with the moisture content of the material being tested.

The instrument is packed in a polished wood case having removable lid. A well is provided in which the probe and flexible leads can be placed when not in use.

Flow Rate Slide Rule

The Foxboro Co., Book Department, Foxboro, Mass., has announced a 12-in. slide rule which has been designed especially for computing orifice plate bores, flow nozzles or venturi throats, and also the rate of flow, or the differential created across the orifice plate (whether flange



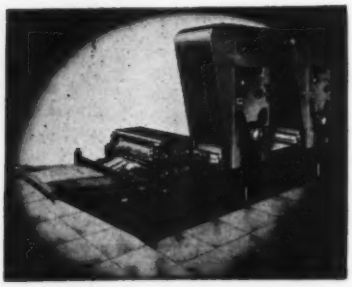
tapped or full flow tapped) or other primary device. The rule, designated as the *Foxboro Flow-Rule*, can be used for all fluids, with or without seals, and covers such a wide range of flows and line sizes that it will handle almost any commercial problem. (Although its average error is well within the accuracy of flow test data, it is not intended to replace computation methods where purchase and sale of fluids are involved. It will, however, be found to be invaluable for checking such calculations.)

The Flow-Rule is constructed on moisture-proof plastic. The slide works easily, without slop or excessive friction. Scales line up without parallax, and are on a white Vinylite with clear plastic covering which protects scale markings.

The Flow-Rule comes in a case of heavy leather, equipped with a plastic window for the owner's card.

Rotary Die for Carton Production

Champlain Co., Inc., 88 Llewellyn Ave., Bloomfield, N. J., has announced a new rotary die designed especially for inline use with standard Champlain Speedry rotogravure presses, that will cut, crease and score, and deliver printed, and even lacquered cartons from a moving web at speeds up to 450 fpm. To assure



full production of most every type of carton, alternate rotary dies may be interchanged with comparative ease. Creasing, scoring, and cutting operations are accomplished separately or in unison, according to requirements.

Cutting and creasing blades are of alloy tool steel, and can be removed easily for resharpening.

New Vinylite Resin

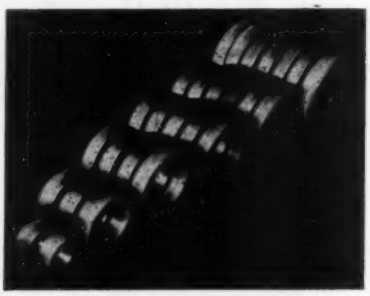
Bakelite Corp., 300 Madison Ave., New York 17, N. Y., has announced the limited production of a new copolymer, Vinylite brand resin VYCC, which is especially designed for use in nitrocellulose lacquers. Among other applications, according to the announcement, this resin, available in butyl acetate solution, will feature prominently in moisture-proofing lacquers for paper and in heat-sealing overprint paper lacquers with exceptional gloss.

Low Temperature Welding Electrodes

Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., has announced the development of two steel electrodes, designated as "Low Temperature" EutecTrodes 66 AC and 660 DC, for arc welding steel at low base metal heat. These electrodes, according to the announcement, produce a smooth, high tensile, crack-resistant weld. They are stated to be particularly suitable for vertical position welding.

Rollers for Bag and Envelope Machinery

Resistoflex Corp., Belleville, N. J., has announced a line of compar rollers for incorporating as feed, friction and guide



rollers on bag and envelope machinery. These rollers, according to the announcement, are unaffected by oils and organic solvents, are light in weight, have high tensile strength, are nonsmearing, have high resistance to wear and abrasion, and are nonstatic.

Motor With Stepless Speed Adjustment

A new line of brush-shifting adjustable-speed induction motors (Tri-Clad, Type ACA), has been announced by the General Electric Co., Schenectady, N. Y. Available in ratings from 3 to 50 hp. (220, 440, and 550 volts), the new motor features stepless speed adjustment over a 3:1 ratio by simply turning a dial. The entire unit, with the exception of the starter control, is self-contained in a housing only a little larger than that for a constant speed motor of comparable rating.

Remote control can be accomplished by use of a flexible cable shaft up to 10 ft. away from the motor. For complete remote control a small pilot motor can be used to drive the speed control mechanism.

For intermittent use, speeds below minimum rated may be obtained by add-

ing secondary resistance. Plugging is possible by the same means. The motor is reversible for short periods of time by reversing two power leads.

Uniform cooling with low intake velocity is provided by double-end ventilation. Necessary over-load protection and limit switches to insure proper starting are

LEADING PAPER MILLS Use Papermakers'

D-I-LESTOIL

(In cooking, washing or pulping)

for...

1. DE-INKING — newsprint, magazine and ledger papers.
2. DE-WAXING — cotton linters — waxed papers.
3. DE-GREASING — rope stock — cotton mill sweeps.
4. REMOVAL of — Asphalt — Pitch — Adhesives — Sizing and other troublesome soil from all raw stock.
5. DEFIBERING — because of its excellent wetting, emulsifying and dispersing action.
6. KEEPING SYSTEMS CLEAN — Felts — Wires — Washers kept clean and costly shutdowns avoided.

CLEAN RAW STOCK MEANS BETTER PAPER

Prove it in your own mill. Write today for FREE working sample of this unequalled cleansing and wetting agent.

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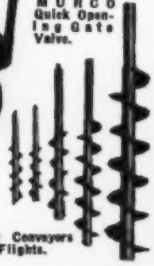
BACKED BY EXPERIENCE OF OVER HALF A CENTURY

MURCO Level Vibrating Double Deck Chip Screen.

Complete details on any equipment that you may require for your papermill or woodroom will be sent you upon request.

- MURCO Axial Flow Agitators—both horizontal and vertical
- MURCO Stainless Steel Improved Flat Screen
- Pulpwood Slashers
- Knot Drills
- Collapsible Winder Shafts
- Knot Saws
- Roll Heading Machines
- Chip Crushers
- Wood Cleaners
- Power Driven Forge Hammers

MURCO Quick Opening Gate Valve.



Screw Conveyors and Flights.

D. J. MURRAY MANUFACTURING CO.

WAUSAU, WISCONSIN

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NOT a chemical;

yet it aids in controlling pitch and slime.

NOT a filler;

yet it remains in the sheet as ash.

NOT a pigment;

yet it increases brightness and opacity, raises pigment retention and improves formation.

NOT a flocculating agent;

yet it has unusual retention properties because of its diatomaceous structure.

DICALITE is a...

high quality inert diatomaceous paper-aid which does its amazing work in paper only as a result of: (1) unique structure and fineness of particles; (2) extremely light weight; (3) natural affinity for tacky substances; (4) excellent dispersion and suspension qualities.

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DIVISION OF GREAT LAKES CARBON CORPORATION

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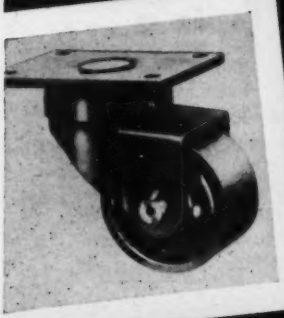
PAPER-AIDS FOR BETTER PAPER PRODUCTS

DARNELL CASTERS

A SAVING AT EVERY TURN



DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

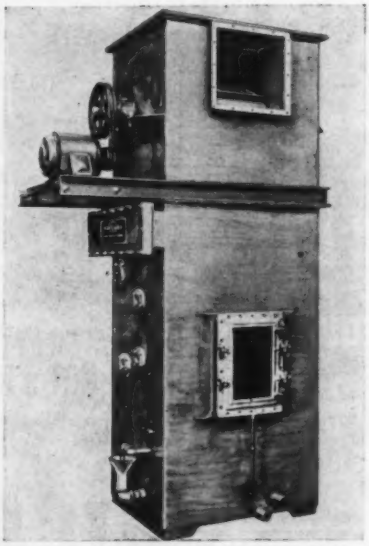
built into the motor. For resistance to oil and heat aging, Formex wire stator windings are used. A cast iron bearing enclosure affords protection from moisture, dust and dirt.

The motor is rated on a constant torque basis. Power factor is high when the motor is running at high speed. At synchronous speed, it is about the same as with a squirrel cage induction motor of similar rating.

Applications for this motor, as suggested by the manufacturer, include small paper machines, draft fans, stokers, pumps.

Air Conditioner

Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y., has announced an air-conditioner, identified as a saturating spray "Type A" machine, which operates on the principle of saturating air with moisture at a given dewpoint temperature and then, by re-heating, producing the exact condition of relative humidity and temperature needed.



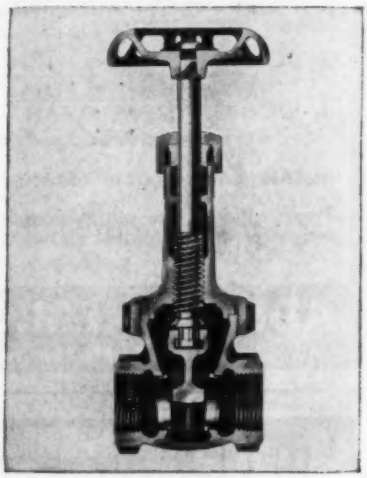
The conditioner illustrated has a casing of stainless steel welded into an integral unit, occupies 7½ sq. ft., and delivers 2,000 cu. ft. of air per minute. Other models requiring up to 50 sq. ft. give air delivery up to 20,000 cu. f.p.m. Controls provide for holding or varying at will the conditions of relative humidity and temperature between 40 Fahr. and 125 Fahr. dewpoint temperature with extremely close tolerance. A dry bulb variation of 1 Fahr. might mean a variation of 4% or 5% in relative humidity. Lower temperatures can be obtained by using Niagara "No Frost" Liquid in the spray solution.

Air Entraining Agent for Concrete

A. C. Horn Co., Inc., Long Island City, N. Y., has announced *Ayr-Trap* as an air entraining agent for use with concrete. Manufactured in two forms—liquid and powder, Ayr-Trap, when used in the proper amount, traps from three to five per cent of air in concrete in the form of tiny, individual bubbles. According to the announcement, entrained air in this amount will improve scaling resistance and in general will protect concrete against its most common causes of failure.

Bronze Gate Valve

A bronze gate valve for 200 lb. service, *Fig. 270-U*, has been developed by Jenkins Bros., 80 White St., New York 13, N. Y. Available in sizes ¼ in. to 2 in., the valve features a newly designed seating combination—a high tensile strength bronze edge seating against Monel metal seat rings of a hardness about 2½ times that of valve body bronze. Seat rings are expanded into body and are equivalent to



integral faces. With this combination, the wear is taken by the bronze wedge, which can be replaced, when necessary, by simply slipping it off the stem and slipping on a new one.

The threads on the spindle, which is of hard, tough manganese bronze, are stated to be longer and larger in diameter—a design to reduce wear and to insure easy operation.

Dimensions of body, bonnet, and bonnet ring are claimed to provide exceptional ruggedness to withstand rough usage, and to contain pressures far beyond those for which the valve is rated. Also the stuffing box is said to be deeper, thus holding more packing, preventing leakage and assuring friction-free spindle operation.

Chlorinated Rubber Base for Protective Coatings

Hercules Powder Co., Inc., Wilmington, Del., has announced the availability of *Parlon*, a chlorinated rubber base for protective coatings (off the market for six years) and the discontinuance of Parlon X, a chlorinated synthetic rubber.

According to the announcement, Parlon, a quick-dry film-forming thermoplastic, is used as a base for concrete coatings, in paper coatings for food packaging (because of the low vapor transmission of these coatings), in adhesives and for specialty inks.

Clean Vacuum Pumps Raise Your Tonnage Output

Pitch, size and dye deposits frequently clog vacuum pumps. When this happens, the vacuum fluctuates and often tonnage output drops.

Meet this situation by cleaning your vacuum pumps the Oakite way. Merely fill your pumps with recommended Oakite solution . . . allow solution to remain during your shutdown period. You will find that Oakite cleaning thoroughly loosens all deposits so that they may be rinsed away.

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PULP AND PAPER MILLS
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COLORS . . .
for Board and Paper

Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds—Yellow Ochres

C. K. WILLIAMS & CO.
Easton, Pennsylvania

New Electronic ROGERS NT-20
KNIFE *and* FACE GRINDER

Fitted with revolving knife holder for grinding flat parts, knives or shear blades.

Set up for Face Grinding Recessed areas or solid sections up to 12" high, 14" wide, 72" long.

from SLOW TRAVERSE . . . 5 ft. per minute

to FAST TRAVERSE . . . 70 ft. per minute

ELECTRONIC CONTROL, operated from a single dial, makes for ultimate knife grinding accuracy. A wide range of speeds can be preset or changed while running. Reversing, quick stopping and complete control at all times are automatically provided for. All vibration noise or shock at reversals is eliminated. Write for literature describing Rogers NT-20, the first machine of its kind.

Pioneer Knife Grinding Manufacturers for Over 60 Years.

SAMUEL C. ROGERS & CO.
165 DUTTON AVE. BUFFALO 11, N. Y.

ROGERS KNIFE GRINDERS
PRECISION QUALITY SINCE 1887

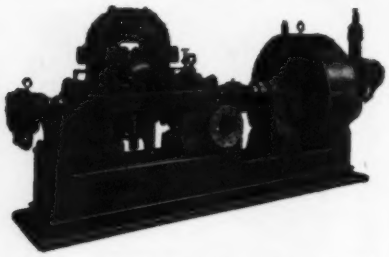
Seamless Welding Pipe Fittings

Ladish Co., Cudahy, Wis., has introduced a new line of seamless welding pipe fittings. The line, in sizes up to 30 in., consists of 90 deg. and 45 deg. elbows, 180 deg. return bends, straight and reducing tees, concentric and eccentric reducers, caps, lap joint stub ends, saddles, shaped nipples, crosses and tees in carbon steel. Among the features in the line, cited by the announcement, are: uniform wall thickness, accurate circularity, full effective radii, smooth inner walls, machined bevel-ends and improved metal structure.

A new tapered design of tee, in which the center sections and crotch are reinforced, the metal tapering off to normal pipe size at the ends, also is featured in the line.

High Pressure Pump

Warren Steam Pump Co., Inc., Mass., has announced the *Type TH Six Stage High Pressure Pump* for boiler feed, debarking and other high pressure requirements up to 1200 psi. Among the advantages of the pump, cited by the manufacturer, are: (1) Increased dependability, efficiency and life results from the pump being in radial balance as well as axial balance; (2) labyrinth casing and impeller



rings, back rings on impellers, stepped interstage seals and grooved rings insure maintained high efficiency; (3) there is only suction pressure on both extra deep stuffing boxes, which increase packing life; (4) heavy section, hardened tubular shaft sleeves and inter-stage sleeves, are packed between sleeves and nut; (5) genuine Kingsbury thrust bearing and plain bearing (ring-oiled) are both water cooled. (Ball bearings available); (6) Safety and dependability are assured by extra heavy metal sections throughout, over-size bolting, ample flange thickness, deep bosses at each bolt and flared nozzle.

Conveyor Belt With Nylon Cord Breaker

The B. F. Goodrich Company, Akron, Ohio, has announced that nylon is now being used to construct its patented transverse cord breaker for its cord conveyor belt. The use of nylon for this service, according to the announcement, gives a higher tensile strength of cord compared to cotton (tests showing that it is at least 55% stronger) and also permits increase in thickness of rubber cushion on both top and bottom of the transverse breaker. Other advantages for nylon cord for this purpose, cited by the manufacturer, are that it will not mildew or rot from dampness or moisture, is not affected by weak acids or alkalies (in case there should be a cut in belt during operations), and gives good resistance to heat.

Self-Contained Vertical Gearmotor

Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa., has announced a self-contained vertical gearmotor that is available in nine different gear ratio combinations, ranging from 7.61:1 to 38.9:1. The unit is designed in sizes from 3 to 50 hp., 220, 440 or 550 volt, 3 phase, a-c,

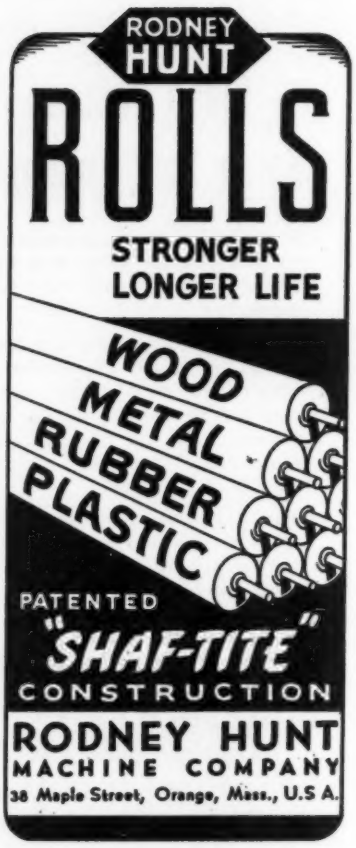
and 3 to 7½ hp., 115 or 230 volt, d-c. All gears and bearings of the design receive positive lubrication at all operating speeds.

Humidity Indicator

A quick-reading humidity indicator, designed for use in industry and laboratory, has been announced by the Weston Electrical Instrument Corp., Newark, N. J. The indicator provides readings of relative humidity accurate within ± 1 per cent for general conditions.

The instrument is of wet and dry bulb type, featuring all-metal Weston laboratory thermometers, self-supporting wet-bulb wick covering the thermal element, sturdy all-metal construction, and a simplified slide rule calculator giving relative humidity reading directly, thus eliminating the need for tables or psychrometric charts. The unit is light and well balanced, and can be swung if desired to create air movement. The only maintenance necessary is to change the wick occasionally and replenish the water in the reservoir, which is a heavy-walled, large-capacity jar, covered to reduce undue evaporation.

The slide rule calculator, located on the face of the instrument directly beneath the two dial-face thermometers, indicates relative humidity from 10 per cent to 100 per cent. With one movement of the slide the proper setting is made according to the readings of the two thermometers, and the per cent humidity is shown immediately on the upper scale. The instrument requires no calibration.



Metallizing Wire With Plastic Binder

Metallizing Engineering Co., Inc., Long Island City, N. Y., has announced *Metco-Weld H*, a wire-composed of a powdered hard-facing alloy extruded with a plastic binder for use with a metallizing gun.

During the spraying operation, the plastic binder is completely volatilized, and the deposit consists entirely of the metallic constituent. Subsequent fusing, with any fusing torch or with an attachment on a Metco metallizing gun, results in a coating alloyed to the base and physically and chemically identical to hard-facings of the same alloy applied by other methods.

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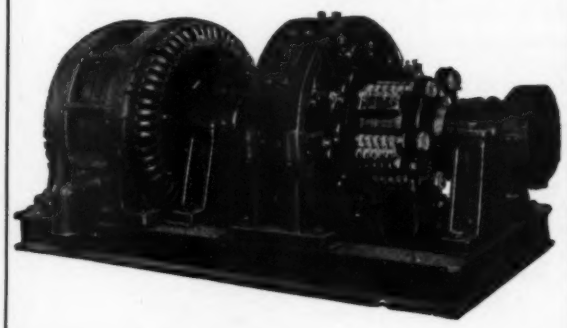

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Sizing—Report of a British Subcommittee

The committee had as its objective a study of sizing that might lead to a standardized method in Great Britain. The committee after discussing the confusion that exists in the use of the term "sizing," defines the term as "the ability of a paper to resist the action of a liquid." However, there are different forms of resistance—e.g. resistance to surface spreading, surface absorption, and complete penetration. These have to be taken into account, as do the variety of liquids to which paper must offer resistance—water, oil, varnish, various inks, etc. Any combinations of these may occur in practice, some more frequently than others.

After considering a large number of different papers, it was decided that standard methods of testing were required for the following: feathering, wetting and spreading, local penetration of aqueous liquids (as in writing), and rate of absorption of aqueous liquids. Other tests were adjudged to be outside of the immediate scope of the committee, which however, made certain suggestions for these other tests. They include the following: penetration of paper by varnish, erasability, oil penetration, dimensional changes, wet strength, water vapor permeability, penetration of dope through carbon paper, and waterproofness of impregnated papers.

Up to the present, only two tests have had a sufficiently wide use to insure their provisional adoption as tentative standards: the Cobb test for water absorption and the dry indicator test for water penetration. The subcommittee's report gives a full description of these tests and also mentions the potassium thiocyanate test as an alternative for the dry indicator test.

In this study, the sizing properties of various grades of paper received attention. The principal groups that were studied were: drawing paper, high grade writing paper, lower grade writings, chart and security papers, newsprint, mechanical printings, lithographic papers, pure printings and high grade book papers, wrapping papers (and kraft generally), wall papers, body stock for coating papers, art papers, liners and laminated boards, carbon papers, and papers used for spirit varnishing. Other miscellaneous papers were also investigated.

In most cases, the Cobb test is applicable. When thin or small samples are at hand that cannot readily be clamped into the Cobb apparatus, the dry indicator method is useful. The characteristics of each of the groups of paper (mentioned above) were reviewed, and the functions of the tests are outlined. Consistency in the behavior of the test is highly important. Neither of the tests suggested by the committee is difficult to carry out, but in the case of the dry indicator test, several possible modifications were suggested in order to increase its sensitivity and reproducibility. V. G. W. Harrison, C. Brown, J. P. Firrell, J. E. G. Ralph and A. H. Wells. *Paper-Maker* (Gt. Britain) 114, No. 2, TS 18-20; No. 3 TS 22-8 (1947) and World's *Paper Trade Review* 128, No. 12, 802, 804, 806; No. 13, 828, 830, 832, 868, 870; No. 14, 896, 898, 913-4, 942 (1947) Through B.I.P.C. 18, No. 3, 184-5 (1947).

Bending Properties of Paper

The so-called "handle" of paper is an elusive quality that appears to be associated with its bending properties. "Handle" includes a sense of bulk, regularity of finish and flatness, as well as elasticity of, and resistance to, bending under its own weight. Referring to the Strachan-Messmer Elastometer, the author points out three factors involved in bending: micellar creep, elastic bending and frictional bending. These are discussed individually and then in their correlation to each other when a strip of paper is bent.

In measuring elastic and frictional movements, the micellar creep (which is slight and time consuming) may be neglected, or at least delayed until the other movements are complete. The creep movement may be observed under the largest load after sufficient time intervals. The first few readings on the instrument are easily recognized as elastic bending. Doubling the load doubles the deflection. Thereafter, the readings give data for an equation covering pure flexural or frictional bending. Strong manila paper was used as a test specimen in obtaining readings that served in calculations separating elastic from frictional bending.

Evidently the Strachan-Messmer Elastometer can be applied to paper and possibly also to many fabrics. James Strachan. *Paper-Maker* (Gt. Britain) 113, No. 2, TS 9-10; 114, No. 2 TS 9-10 (1947) through B.I.P.C. 18, No. 3, 185 (1947).

Sex Hormones from Tall Oil

Phytosterol, which may be obtained from tall oil, is now being used for the synthesis of sex hormones. The author has analyzed the tall oil obtained from a number of mills for sterol content. Samples from one mill contained as much as 9% sterols precipitable with digitonin. Samples from some other mills were as low as 0.6% in sterol content. If the tall oil was heated to 100 C., the greater portion of the sterols were esterified. If the temperature approached 270 C., the esterified sterols were largely destroyed. The difference in potential sterol yield of tall oil samples is probably caused by the heating of the tall oil in distillation. Terje Enkvist. *Svensk Papperstidn.* 50, No. 15, 351-353 (1947) (In Swedish, with German and English abstracts).

Wet Strength

The authors discuss provisional methods for testing the wet strength of paper in Great Britain. Tensile and bursting strength testers have been standardized by the Paper Testing Committee, and these are described. The tensile strength is carried out with the Finch attachment for carrying out tests directly after very short soaking periods.

The sample strips are about 15 cm. in length and are cut in both directions, as indicated for the dry tensile strength tests. No special preparation is required for samples used in the bursting strength test. For absorbent papers, the standard soaking time is 15 seconds. With papers where wet strength must be retained for long periods, the soaking time is two hours. The water used is either tap or distilled water, but in the former case the pH should be between 6.5 and 7.5, and the total solids must not exceed 50 part per hundred thousand. The temperature of the tests should be maintained at 20 deg. (±2 deg.). If there are any deviations from these directions they must be stated when giving results of the tests. With papers requiring only a 15-minute soaking and for all papers with a bursting strength below 5 lb. psi., the pop test is unsuitable, and in such cases the tensile tester should be used. Results should be expressed in terms of the dry treated paper (i.e., percentage) but in addition it is recommended that actual values be given. In general, the bursting test after immersion shows a higher degree of strength retention than does the tensile strength test. Hence, it is important to draw a distinction between these tests when reporting on the wet strength of a paper sample.

The so-called "rub resistance test" is being investigated and will be the subject of a later report by the committee. G. F. Underhay, B. H. Browning, L. F. Fuller, F. L. Hudson and G. Schofield. *Paper-Maker* (Gt. Britain) 114, No. 1 TS 7-8; No. 2 TS 16-18 (1947); through B.I.P.C. 18, No. 3, 186.

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Hydraulic Mounting Technique for Roller Bearings

(Continued from page 1669)

measure the force for final removal. It has varied between 5,000 and 12,000 lb. and is usually about 9,000 pounds. It is obviously a great help to have to pull a distance of only ½ in. instead of 8 to 10 times that amount with a force of only 1 per cent rather than 100 per cent.

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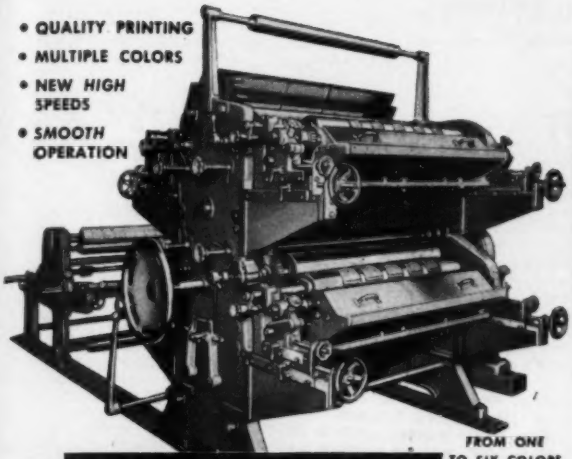

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New Catalogues and Publications

The Louis Allis Company, Milwaukee 7, Wis.—Descriptive of their line of type "CT" Rolled Shell, Shaftless Squirrel Cage Induction Motors for built-in drives, is Bulletin 516-D issued by this company. Details of electrical and mechanical features, mounting, ventilation and application are included, as well as a table of horsepower ratings per frame diameter.

American Lumber & Treating Company, 332 S. Michigan Ave., Chicago 4, Ill.—A new four-page folder covering the usage and specifications of "Wolmanized" lumber has been released by the company. It describes the properties and characteristics of forest products alloyed with "Wolman" wood-preservative salts and "Minalith" fire-retardant salts. It also outlines the pressure-treating process used for applying these twq treatments and creosote. The proper construction usage of treated wood and standard specifications for treatment are included. Folder sent upon request to advertising department of the company.

Amercoat Division, American Pipe & Construction Company, P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif. —Available upon inquiry to the company's advertising department is a 12-page catalogue giving complete details on the chemical and physical properties, application instructions and other pertinent data on protective coatings.

Baldwin Locomotive Works, Philadelphia 42, Pa.—A new bulletin describing the line of Southwark steam platen presses engineered and built by this company is now available. It is illustrated with photographs of miscellaneous types of presses. One of the uses for these presses is in the fabrication of insulating and wallboard. Bulletin 254 may be obtained from the Advertising Department, Baldwin Locomotive Works, Eddystone, Pa.

Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark 4, N. J.—A new illustrated Technical Bulletin No. 1143, describing its Micro-Gas Analyser for the determination and analyzation of gases or vapors within their toxic range has been issued by this company. The bulletin tells how any gas that will ionize in water, with or without heat, can be determined and analyzed. It also explains how the solution is de-ionized and converted to its original state. A toxicity table for 73 gases or vapors is included.

Dings Magnetic Separator Company, 4740 W. McGeogh Ave., Milwaukee 14, Wis.—Just issued by this company is a new bulletin, No. 260A, describing Perma-Pulley, a permanent alnico magnetic head pulley for belt conveyor systems. Uses of the Perma-Pulleys for the removal of tramp iron, purification of non-magnetic substances and concentration of magnetic materials is described. The bulletin also contains dimensions, capacities, weights and other specifications, and describes the design of the unit.

Eagle-Picher Company, Cincinnati 1, Ohio—Now available from this company is a booklet published as a guide for the use of diatomaceous earth in the paper industry. The advantages of using this material as a filler are explained.

Filtration Engineers, Inc., 858 Summer Ave., Newark 4, N. J.—Just published by this company is Bulletin No. 102, which includes a cutaway view and completely illustrated explanation of rotary vacuum filter operations. Additional diagrams show how many special filtration problems can be solved with the use of accessory FEinc equipment. The bulletin is suitable for engineering classroom use.

Leeds & Northrup Company, 4934 Stenton Ave., Philadelphia 44, Pa.—A 16-page catalogue which will serve as a handy guide to all their round-chart Micromax instruments is now offered by this company, under the title "Micromax Model R—Indicating Recorders and Controllers." It includes easy-to-use tabular form specifications for automatic indicating recorders and indicating and recording controllers. Among the latter are instruments which provide two-position control or are integral parts of full proportional control systems. Also listed are suggested chart numbers for the more commonly used ranges, together with other accessories and supplies. Write for Catalogue No. ND44(2).

Hills-McCanna Company, 3025 N. Western Ave., Chicago 18, Ill.—An attractive catalogue on its Saunders Patent Diaphragm Valve has been published by this company. The booklet includes operating features, installation views (including one in a paper mill), available types, operating data and service recommendations. Various uses in the paper mill for this valve appear under the service recommendations. Complete specifications are given, also helpful information for ordering.

Link-Belt Company, 307 N. Michigan Ave., Chicago 1, Ill.—Just released by this company is a new 16-page illustrated Book No. 2196, covering the advantages of "DE" Radial Thrust, Self-Contained, Preadjusted Roller Bearings. The book also contains tables of dimensions, weights, bearing capacities at given revolutions per minute, shaft fit tolerances, housing fit tolerances, and the data necessary for calculating the required bearing capacity for different types of machinery. This book may be obtained by addressing the Link-Belt Company, Ball and Roller Bearing Division, 518 N. Holmes Ave., Indianapolis 6, Ind., or the nearest office.

Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y.—An illustrated and comprehensive bulletin describing their new "Light Duty-Low Air" L Gun has been prepared by this company. Ask for Bulletin 55. Another Bulletin, No. 57, is also available, describing the time and money-saving features of Metco Sprabond, which can be used for metallizing without preparation.

Mine Safety Appliances Company, Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. A circular descriptive of their Model "B" Velocity Power Driver may be had from this company. The driver is used to anchor pipe hangers and conduit boxes to structural plate or concrete. Heating and ventilating ducts, water and sprinkler lines, are within the scope of this new tool.

The Norton Company, Worcester, Mass.—Just published by this company is another of their valuable and informative handbooks, entitled "Injury in Ground Surfaces." It contains the most up-to-date and complete treatment of this subject. The author is Dr. L. P. Tarasov of the Norton Research Laboratories. Featured in the book are many photographs showing clearly the numerous types of defects, such as cracks and burns, which are sometimes found in ground surfaces. It is written for people concerned with the practical aspects of grinding, such as makers of tool steel, tools, dies and hardened steel parts. This publication should appeal also to metallurgists dealing with these problems, since it presents in detail latest information on the detection of injury and the method of procedure in trouble shooting.

Tri-Clover Machine Co., Kenosha, Wis.—Just announced by this company are two new bulletins: No. 747, "Zephyrweld Stainless Steel Welding Fittings Catalogue," and No. 847, "Stainless Steel Flanged Type Conical End Fittings Catalogue." The latter describes fittings which are available in sizes from 1" through 10" O.D. Both catalogues include data on physical characteristics; fabrication and adaptability of these fittings to other types; stainless steel tables; bursting pressure data, etc. No. 747 contains complete information covering methods in which these new fittings are installed with light gauge commercial tolerance (O.D.) stainless steel tubing to provide lightweight corrosion-resistant liquid conveying lines. Catalogue No. 847 describes the way in which these new fittings are installed through the use of leak-tight flanges to light gauge commercial tolerance (O.D.) stainless steel tubes, providing lightweight corrosion-resistant liquid conveying lines which will withstand bursting pressures up to 9,750 psi. (for 1" O.D. 16 ga. tubing).

C. H. Wheeler Manufacturing Co., Lehigh and Sedgley Aves., Philadelphia, 32, Pa.—Just off the press is a new catalogue, No. 1462, describing the "Steam Jet Ejectors" made by this company. The 36-page booklet includes 30 sectional drawings, also flow diagrams, engineering data, installation guide, formulae, curves and tables. It covers the theory and operating characteristics of steam jet ejectors for all classes of vacuum service, including single, two, three, four and five stage types, with barometric inter-and-after condensers for vacuum requirements in chemical plants, power plants, etc. It also contains information regarding steam jet vacuum refrigeration for water cooling requirements of air conditioning and process applications.

Books

How to Prepare and Maintain a Supervisors' Policy Manual—A publication of the American Management Association, 330 West 42nd St., New York 18, New York, this paper-covered monograph of 72 pages, written by Eileen Ahern, brings together in compact form the practices of a number of companies which have had experience with manual programs. Scott Paper Company is listed as one of the numerous firms participating in the study. The major subjects treated in the monograph are: A Supervisors' Policy Manual—An Aid to Top Management; Planning the Manual; Steps in Preparing the Manual; and Manual Distribution and Maintenance. The list price of the book to non-members of the Association is $3.00 a copy.

Small Wonder . . . The Story of Colloids — Written nontechnically, this book, by Gessner G. Hawley, tells what colloids are, why they act as they do, and why their behavior holds the key to the secret of life. The book is made up of the following chapters: What It's All About; Large Things and Small; Discovery and Occurrence of Colloids; Colloids Become Visible; Electrical Lifebelts; The Purification of Water; Curds and Whey; The Tears of the Weeping Tree; Blood; Glues and Adhesives; The Importance of Surface; Soaps, Detergents, and Emulsifiers; Colloid Chemistry and Life; and Design for Science.

The author concludes the volume with the following statement: "The colloidal viewpoint will not of itself settle all or even very many of the questions still before us; but it will serve to clarify them, and to provide a fresh and flexible means of interpreting —this world of ours and worlds unseen—and thin the boundary between."

Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N. Y., is publisher of the book. The price is $3.50 a copy.

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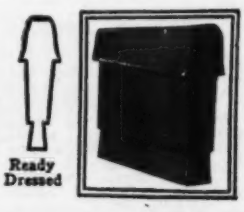

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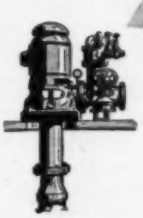

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Canton Flannels, Bleached	11.00 to 11.50
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White Shrunk	11.00 to 11.50
Silesias No. 1	9.00 to 9.50
New Unbleached	13.00 to 13.50
Fancy	7.00 to 7.50
Linen Cuttings—	
American	8.50 to 9.00
White	14.50 to 15.50
Grey	13.50 to 14.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Roofing—	
No. 1	2.00 to 2.05
No. 2	1.90 to 1.95
No. 3 and No. 4	1.70 to 1.80
Twos and Blues—	
Repacked	3.25 to 3.50
Thirds and Blues—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75
Whites, No. 1—	
Repacked	4.50 to 4.75
Miscellaneous	3.75 to 4.00
White, No. 2—	
Repacked	3.50 to 3.75
Miscellaneous	3.00 to 3.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings New Mixed Cuttings New Light Silesias Light Flannelettes Unbleached Cuttings New White Cuttings New Light Oxfords New Light Prints	Nominal

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens No. 2 White Linens No. 3 White Linens No. 4 White Linens No. 1 White Cottons No. 2 White Cottons No. 3 White Cottons No. 4 White Cottons Extra Light Prints Ord. Light Prints Med. Light Prints Dutch Blue Cottons French Blue Cottons French Blue Linens Checks and Blues Linsey Garments Dark Cottons Old Shopperies	Nominal

ROPE and BAGGING

f.o.b. and ex dock New York City

(All Prices Are Nominal)

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	6.75 to 7.00
Wool Tares—	
Light	6.75 to 7.00
Heavy	7.25 to 7.50
No. 1 Scrap Bagging	6.00 to 6.25
Manila Rope—	
No. 1 large	6.50 to 6.75
No. 1 small	5.50 to 5.75
Sisal Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.50 to 6.00
New Burlap Cuttings	6.75 to 7.25
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.50 to 5.75
No. 2 sisal	5.00 to 5.25
Soft jute	4.50 to 4.75
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

(All Prices Are Nominal)

	per ton
Shavings—	
Hard White Env. Cuts	150.00—
Hard White, No. 1	120.00—
Soft White, No. 1	100.00—
Soft White, One-cut	120.00—
Soft White, Misc.	90.00—
Fly Leaf, No. 1	55.00—
Fly Leaf, Woody, No. 1	45.00—
No. 2 Mixed Col. Woody	35.00—
Flat Stock—	
No. 1 Heavy Books and Magazines	29.00 to 31.00
Mixed Books	21.00 to 22.00
Ledger Stock—	
No. 1 white	90.00 to 95.00
No. 1 Mixed (Colored)	75.00 to 80.00
Manilas—	
New Env. Cuttings	130.00 to 140.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manilla Tab Cards, Free of Ground Wood	90.00 to 95.00
Colored Manilla Tab Cards	65.00 to 70.00
Kraft—	
New Envelope Cuttings	115.00 to 120.00
Tripled Sorted No. 1 100%	70.00 to 75.00
New 100% Cor. Cuts	65.00 to 70.00
No. 1 Old Assorted	52.00 to 55.00
News—	
White Blank	85.00 to 90.00
Overissue	24.00 to 25.00
No. 1 Baled	20.00 to 21.00
Old Corrugated Containers	28.00 to 29.00
New Corrugated Cuts	85.00 to 87.00
Mill Wrappers	23.00 to 24.00
Box Board Chips	10.00 to 11.00
No. 1 Mixed Paper	12.00 to 13.00

CHEMICALS

f.o.b. shipping point

(All Prices Are Nominal)

Alum (Papermakers)—	
Lump, cwt.	4.25—
Ground, cwt.	4.00—
Powdered, cwt.	4.40—
Blanc Fixe—	
Pulp, bulk, ton	$72.50—
Dry, barrels, pound	82.50—
Bleaching Powder—	
Drums, cwt.	3.00 to 3.50
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
30-100 mesh (bags), lb.	32.00 to 34.00
Argentine, lb.	30.50 to 32.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.25 to 2.50
Gelatine (silicin), lb.	1.60 to 1.65
Glyc. (C.P.) drums, lb.	.39½ to .40
Litharge, powd., bbl., lb.	.16½ to 17
Rosin (Gum)—	
New York, per 100 lbs.	
E	9.25—
F	9.65—
G	9.65—
WW	10.25—
Rosin (Wood), carlots	6.50—
Salt Cake—	
Dom. bulk (wks) ton	20.00 to 25.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	25.00 to ——
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.25 to 1.35
Barrels, cwt.	1.35 to 1.60
Soda (Caustic)—	
Solid drums, cwt.	2.65 to 2.85
Ground and flake, drums, cwt.	3.00 to 3.25
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg. 55 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	7.22—
Pearl, barrels, cwt.	7.22—
Paper, (Sp.) bags, cwt.	7.22—
Powdered, barrels, cwt.	7.23—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	30.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig. bbls., lb.	17½ to .18
Calcium Pig. bbls., lb.	.17 to 17½
Zinc Sulphide, bbls., lb.	10.50 to 10.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

(All Prices Are Nominal)

Bleached sulphite, Swedish	175.00 to 185.00
Bleached sulphite, Finnish	185.00—
Bleached sulphite, dom.	126.00 to 135.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	145.00 to 165.00
Unbleached sulphite, Fin.	155.00—
Unbleached sulphite, dom.	125.00 to 130.00
Unbleached kraft, Swedish	140.00 to 155.00
Unbleached kraft, Finnish	147.50—
Unbleached kraft, northern	125.00 to 135.00
Unbleached kraft, southern	110.00 to 125.00
Bleached sulphate, Swedish	175.00 to 185.00
Bleached soda, domestic	130.00 to 135.00
Sulphite screenings, dom.	60.00 to 70.00
Sulphate screenings, dom.	60.00 to 70.00
Groundwood, domestic and Canadian	80.00 to 85.00

PAPER

f.o.b. New York City

(All Prices Are Nominal)

	per ton
Boards—	
Binders	94.00—
Chip	90.00—
Chip, tube and can	95.00—
Chip, full blending	97.50—
Chip, sgl. mla. lined	95.00—
Coated, white patent .016	120.00—
.020 and heavier	110.00—
Kraft liner	70.00—
Filled News	90.00—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

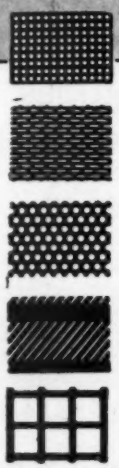
Book, White (M. F.)—	
A Grade E. F.	14.25—
B Grade E. F.	—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	19.55—
No. 2 Glossy	18.30—
No. 3 Glossy	17.60—
No. 4 Glossy	—
No. 2 Offset	15.25—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—

	per cwt.
(In Ton Lots)	
Extra 100% Rag	48.70—
100% Rag	43.70—
75% Rag	33.10—
50% Rag	27.50—
25% Rag	24.50—
Rag Content Ledger—	
(In Ton Lots)	per cwt
Extra 100% Rag	48.00—
100% Rag	42.10—
75% Rag	33.10—
50% Rag	28.25—
25% Rag	25.10—
Sulphite Bond—	
	per cwt
Air dry, watermarked	—
No. 1 watermarked	18.25—
No. 2 watermarked	17.25—
No. 4 watermarked	16.50—
Sulphite Ledger—	
	per cwt Zone 1
No. 1 watermarked	19.10—
No. 2 watermarked	18.05—
No. 4 watermarked	17.35—
Glassine (f.o.b. mill)—	
	per cwt
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof— Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
News—	
	per ton
Rolls, Standard (Contract)	96.00—
Rolls (Spot)	(Nominal)
Sheets	115.00—
Tissues (Carlots)—	
	per ream
White No. 1	1.75—
White No. 2	1.60—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M shts.) per cs.	7.60—
Toilet, Unbleached (M. shts.) per cs.	6.40—
Towels—	
	per case
Bleached	4.75—
Unbleached	4.00—
Wrappings (Kraft)—	
	per cwt
Super-Standard	8.00 to 9.00
No. 1 Wrapping	6.75 to 7.25
Standard Wrapping	6.50 to 7.00
Standard Bag	6.50 to 7.00
Variety Bag	—
Wrappings (Sulphite and Bleached Kraft)—(Rolls, f.o.b. mill)	
Bleached Papers—	
	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Grd Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envy. Mla., Sub. 16-28 (No. 2)	—
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—

Perforated Metals



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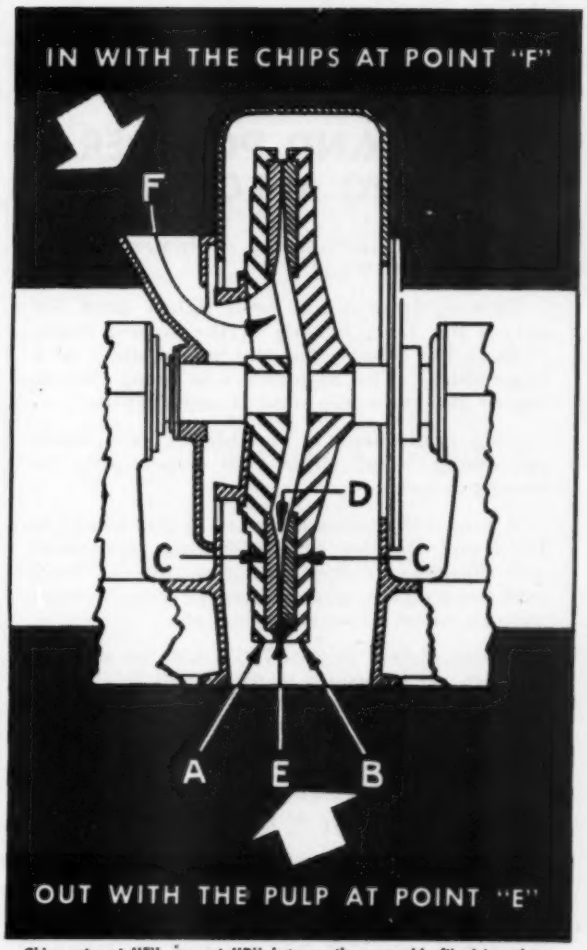

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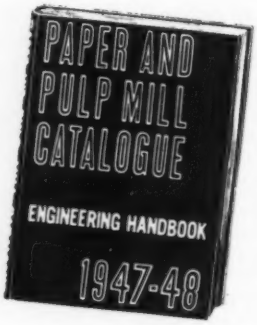

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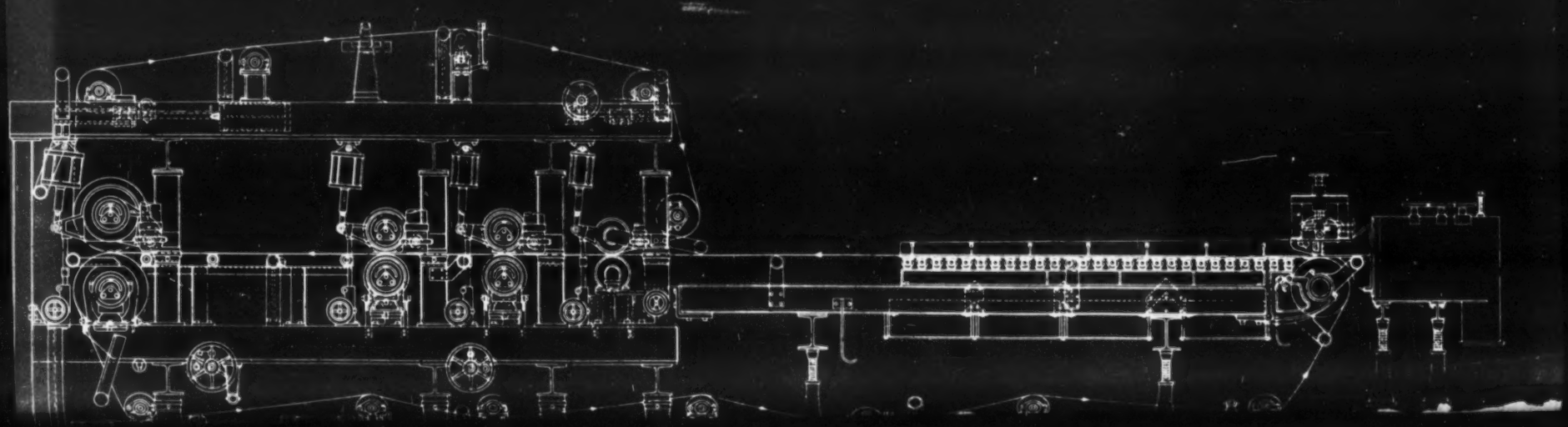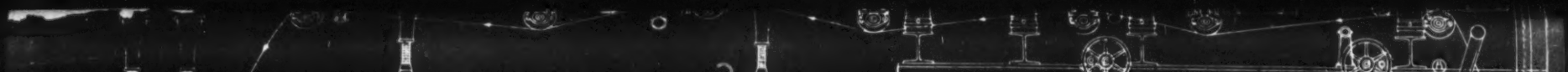
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